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EVALUATION OF THE NUTRITION AT SCHOOL

PROGRAM: TEACHER INVOLVEMENT

BY



BARBARA MCEWEN

A THESIS

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entitled EVALUATION OF THE NUTRITION AT SCHOOL PROGRAM

TEACHER INVOLVEMENT

submitted by BARBARA ELLEN MCEWEN

in partial fulfilment of the requirements for the degree of
MASTER OF SCIENCE IN CONSUMER STUDIES.

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ABSTRACT

An evaluation of teacher involvement was conducted within the context of the Nutrition at School program in Alberta. A review of the evaluation literature was done, and a model of evaluation was proposed. Theoretically, the concept of evaluation was considered to consist of evaluability assessment; articulation of management information needs; application; and disposition stages.

The evaluation itself employed a summative approach consisting of a province-wide mail survey of teachers of grades K to 6. The study looked at teacher involvement in teaching nutrition concepts, use of nutrition education resource materials, and reaction to follow-up materials developed for the program. A sample of 274 teachers responded to the survey. Teachers were found to be in general supportive of Nutrition at School and that the workshop and food sample program acted as motivators to encourage teacher participation. Involvement by teachers was found to decrease in subsequent years after the food sample program ended and suggestions were made for encouraging participation through use of materials and activities that were appealing, appropriate to grade level, easily implemented, and acted as motivators to continue to teach nutrition. The suggestion was also made that more emphasis be placed on the total teaching environment and the overall school curriculum when planning the program.

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STATEMENT OF THE PROBLEM

Program planners need to know enough about the effects of their program in order to make decisions which will allow the program to function at optimum effectiveness and in order to improve accountability. Program evaluation, as an ongoing part of the administrative and program planning process, should shed some light on why a program or some facet of a program does or does not work. An evaluation can go beyond this, even, to probe the combination of factors that contribute to the effects of the program or that have explanatory power.

Description of the Program

This study involved the evaluation of certain facets of the Nutrition at School program, a nutrition education program funded and administered by Alberta Agriculture. The program was initiated in 1973 in response to the Nutrition Canada National Survey (1975) and a national report, One Child One Chance (1973), both of which stressed the need for nutrition education in the classroom. In the report, One Child, One Chance it is indicated that "(Canadian) children in particular are suffering from the effects of undernutrition that can reduce their physical and mental development and deprive them of their one chance to develop the full potential for their one life" (1973, 1).

The national survey report states "the possibility of malnutrition and undernutrition exists in all segments of our society and its results are, in fact, found at all income levels" (1975, 35). The Nutrition at School Program, developed in response to this need, was based on three major goals which refer to the three target audiences for the program: the child, his or her parents and the teacher. The goals were as follows:

- 1) Elementary school children will acquire knowledge about their nutritional needs and the nutritive value of foods, develop positive attitudes toward eating a variety of foods, and develop eating habits which foster health and well-being.
- 2) Parents will acquire knowledge about nutritional needs and will be motivated to apply this knowledge to their family's eating habits, thereby reinforcing what their children have learned in Nutrition at School.
- 3) Teachers of elementary school children will include nutritional concepts in their classroom curricula.

The Nutrition at School program was divided into two levels: one for Grades K to 3 and the other for Grades 4 to 6. To provide a framework for the teachers and to aid in program implementation, each level had two key concepts and four teaching objectives aimed towards achievement of the major goals of the program. At level one, the primary grades K-3, the two key concepts were:

1. A balanced daily diet includes foods selected from each of the four food groups.
2. Foods from the four food groups supply the nutrients needed for growth, health and energy.

To facilitate learning of these two concepts, the program was organized into four teaching objectives:

1. Identification - The student will be able to name and enjoy a variety of foods from the four food groups.
2. Classification - The student will be able to classify foods into the four groups.
3. Selection - The student will be able to choose nutritious snacks and well-balanced meals from the four food groups.
4. Function - The student will explain the importance of foods from the four food groups for growth, health and energy.

At level two, grades 4 - 6, the two key concepts were:

1. A wide variety of nutrients is essential for growth, health, and energy.
2. A combination of foods from the four food groups provides the necessary nutrients to perform these functions.

The four teaching objectives associated with these key concepts were:

1. Identification - the student will discover by experiment, that different foods contain different nutrients.
2. Classification - The student will classify foods into the four food groups on the basis of nutrient content.
3. Function - The student will identify the functions of the leader nutrients in each of the four food groups in terms of growth, health and energy.
4. Selection - The student will choose nutritious snacks and well balanced meals from the four food groups.

Available to all elementary schools in Alberta, the program operated on a rotational basis. Schools applied to take part in the program and each year new schools were chosen in order to expose the maximum number of communities to good nutrition habits.

The program featured nutritious food samples together with nutrition education integrated into the regular school curricula. The program ran for approximately twelve weeks with child-sized food samples being served from two to four times per week, generally just before the morning recess. Schools were encouraged to continue the inclusion of nutrition education in following years with the support and consultative services of Alberta Agriculture.

One selection criterion for participation of a school in the program was teacher attendance at a half-day teacher workshop presented by Alberta Agriculture Home Economists. The workshop was intended for teachers and others, such as school principals, involved in teaching the Nutrition at School program and was designed to give a reliable foundation of nutrition information. In addition, it allowed the opportunity for teachers to participate in some enjoyable nutrition teaching and learning activities which could be used in future teaching. Two workshops were available: one for teachers of grades K to 3; and one for teachers of grades 4 to 6. The most important teaching resource for this program was the curriculum package called "Big Ideas in Nutrition Education". One package was designed for grades K to 3 and another for grades 4 to 6. Behavioural objectives were contained in each package along with suggestions for learning activities and teaching resources designed for teaching the objectives. At the time of the workshop, each teacher was given a copy of a "Big Ideas in Nutrition Education" package suited to his or her grade level. The expectation was that the teacher would integrate the teaching of nutrition in a unique way within the suggested framework and use the resource materials

provided. The teacher thus played an important role in meeting the broad objectives of this program by facilitating the transfer of food and nutrition information between Home Economists and students and parents, and by influencing attitudes towards nutrition.

Focus of the Evaluation Study

The evaluation study reported in this thesis concerns the involvement of one target audience, the teachers, in the program. The evaluation focused on certain problems identified by members of the Nutrition at School Core Committee. These problems had been stated in the form of general questions covering issues of concern to the decision-making body for the program. The evaluation primarily focused on the third main goal of the program: Teachers of elementary school children will include nutritional concepts in their classroom curricula. Although the goal was not stated as such, it was hoped that involvement in the Nutrition at School program and participation in the teacher workshop would motivate teachers to continue to incorporate nutrition into their teaching and to continue to use material contained in the curriculum package, "Big Ideas in Nutrition Education", after the program ended.

The initial questions identified by the Nutrition at School Core Committee, which this evaluation attempted to answer were:

1. In the year in which teachers participated in Nutrition at School teacher workshops, did teachers include nutritional concepts in the curricula?

2. If teachers included nutritional concepts in their curricula, which materials in the "Big Ideas in Nutrition Education" curriculum package were used and what other resources were used?
3. In subsequent years, following the teachers' participation in Nutrition at School teacher workshops, did teachers continue to include nutritional concepts in their curricula?
4. If, in subsequent years, teachers continue to include nutritional concepts in their curricula, which material in the "Big Ideas in Nutrition Education" package were used and what other resources were used?
5. If yes to above, does the material become too repetitive as the students progress from one grade to the next?
6. If follow-up activities are taking place, what are they, and how effective are they in teaching nutrition?
7. What kind of resources could Alberta Agriculture provide which would motivate and support teachers to continue to include nutritional concepts in their curricula? In what subject areas should resources be provided?
8. If funding for special follow-up projects is provided by Alberta Agriculture, is more nutritional education included in the curricula than without funding?
9. Are the follow-up units being developed by the follow-up committee useful to teachers teaching nutrition?

During the early stages of the evaluation several additional questions were added. These other issues identified by members of Nutrition at School Core Committee concerned follow-up to the Nutrition at School program. These questions were:

10. How often do teachers feel children should be exposed to nutrition education in the school?
11. If the teacher continues to use the "Big Ideas in Nutrition Education" materials after the program ends in their school, for how long would the materials be adequate for the teacher to effectively teach nutrition education?
12. Given a list of possible types of "follow up" to

the Nutrition at School program, how useful do teachers perceive each to be for teaching nutrition education in their classroom.

These twelve questions constituted the focus of the evaluation reported in this thesis. The evaluation involved design of an evaluation strategy which would best meet the client needs, answer the questions posed, and have the potential of optimally affecting the decision-making process.

This study was intended to provide useful information in a number of ways. First, it endeavored to answer specific client questions concerning some aspects of a nutrition education program. The information gained should be useful to the members of the Nutrition at School Core Committee in making decisions to improve the effectiveness and efficiency of the Nutrition at School program. Secondly, it has attempted to further our understanding of the teacher's use of educational materials, and their focus on concepts and teaching objectives and use of nutrition education materials in implementing the Nutrition at School program. Thirdly, it assisted in the identification of the usefulness of evaluation as an ongoing part of the planning of nutrition education programs. Problems encountered in conducting an evaluation of this type have been identified and ways suggested for overcoming these problems.

CONCEPTUAL FRAMEWORK

Introduction

The conceptual framework developed for this study and the assumptions upon which it is based grew out of a review of the literature on evaluation which will be briefly discussed in this chapter. A review of the state of the art of evaluation theory, models that have been developed for conducting evaluations, issues in evaluation which the models attempt to resolve, and the conceptual framework developed and utilized in this study will be described. In addition, the chapter will detail the application of the framework developed to the Nutrition at School program evaluation.

Evaluation: The State of the Art

Evaluation is in a rapid state of development. The formal evaluation of social and educational programs is a relatively new result of the growth of modern programs which are too complex and expensive to be evaluated by former informal means. A broad theoretical framework for evaluation is, in general, lacking, and as a consequence "evaluations have often been attempted without the benefit of adequate frameworks or with inappropriate methodologies" (Franklin and Thrasher, 1976, 78). MacKay and Maquire called the technology known as curriculum evaluation "a loose set of models, recipes, and practices" and noted that evaluation

as term meant something different to every writer (1971, 4).

Many models have been developed by various researchers to suit the specific circumstances and context in which the reported evaluations took place. These models, some of which will be reviewed in a later section, vary in scope, substance and emphasis. They do, however, share certain common characteristics in that they all attempt "to measure the degree of achievement of short-range, intermediate, and long-range program objectives; to relate measures of achievement to program inputs and to non-program factors; to determine how and why the achievements were accomplished; and to communicate evaluation findings to planners and administrators for program improvement and/or redefinition of objectives" (Gorosh, 1978, 163). These models vary from detailed workbook approaches to general process models, most of which were designed for specific programs. Few researchers, however, have attempted to fit these methodological and technical descriptions into an overall theoretical framework for evaluation.

Franklin and Thrasher's (1976) model comes closest to a theoretical, rather than a technical, model of evaluation which they view has its basis in general systems theory. The systems terminology of input-processor-output is utilized as a means of conceptualizing evaluation and of differentiating between various program evaluation models. The basic assumption of this framework is:

"...that the organization, here called the "processor", is designed to bring about some change, ...to meet some need or to alleviate an undesirable condition. To accomplish this, there are certain

inputs; financial and personnel resources, clients, information ...[which] are "processed" in ways designed to accomplish the purposes of the organization, the results being the organization's outputs Feedback information about how well the organization is performing is necessary ...[upon which] decisions are made about maintaining or altering the amount and kind of input, the nature of the processing activities, or both" (Franklin and Thrasher, 1976, 142).

The use of this framework serves as a paradigm for categorizing types of evaluation activities.

The first of these types, input evaluation, consists of needs assessment and the evaluation of effort. Effort evaluation consists of enumerating the extent and type of program effort. Suchman (1967) states: "Evaluations in this category have as their criterion of success the quantity and quality of activity that takes place ...It is intended to answer the question "What did you do" and "How well did you do it?" (1967, 61). Effort evaluation is useful for assessing the utilization of resources in terms of program priorities, for monitoring changes in the demand for services, and for explaining the program activities to the funding sources.

Needs assessment, the other type of input evaluation, is an area where program planning and evaluation can overlap. Franklin and Thrasher caution that "if needs assessment is to be used as an evaluative device the approach that will be most amenable to the later assessment of impact should be chosen" (1976, 145). They list several approaches which can be used to assess needs including the "key informant" and "community forum" approaches (1976, 146). The most satisfactory form, however, to these authors is the survey approach.

Process evaluation determines what goes on within the program. It generally includes "program monitoring, client tracking, cost accounting, compliance, indicators of adequacy, and general "goal directedness" (Franklin and Thrasher, 1976, 151). The most common form, program monitoring, gives program managers data about how their projects are going and if they are following program guidelines. Outcome evaluation addresses the results of the program by means of follow-up surveys, cost-beneficial analysis, and impact evaluation which is linked to the needs assessment of input evaluation.

Franklin and Thrasher have, therefore, attempted to discuss evaluation within a simplified systems model which moves from the identification of need, through the analysis of services to the identification of impact. Other researchers including Stufflebeam (1967); Tien (1979); and Provus (1971) have also made extensive use of systems thinking in their work. Stufflebeam sees evaluation as the process of acquiring and using information for making decisions associated with planning, program implementing and recycling program activities. Evaluation is viewed as consisting of four stages: Context Evaluation (identification and assessment of needs and problems underlying the needs); Input Evaluation (assessment of system capabilities, available input strategies, and designs for implementing the strategies); Process Evaluation (identification and prediction, in process, of the defects in the design or its implementation); and Product Evaluation (relation of outcomes to objectives, context, input and process information). The Provus (1971) approach is similar, consisting of four stages: definition, installation, process, and product. MacKay

and Maguire note that use of the systems approach "is an attempt to include more traditional notions about evaluation within a framework that comprehends a large number of variables or factors which have an impact upon curriculum programs" (1971, 40).

Scriven also attempted to present a broad conceptualization of evaluation. He defined the goal of evaluation as "to estimate the merit, worth or value of the thing being evaluated" (1967). MacKay and Mcquire (1971, 10) describe Scriven's contribution to the field of curriculum evaluation as "to set the evaluation house in order". They also noted Scriven's observation that the distinction between the roles of evaluation and the goals are often blurred. He pointed out that the subversion of goals to roles was very often a misguided attempt to overcome the anxiety in those educators whose products and activities are being evaluated. Scriven also made the distinction between the two broad roles of evaluation: formative and summative.

Morris and Fitz-Gibbon (1978) also utilized a broad framework for evaluation. Drawing from many of the models of evaluation previously developed which primarily outline how their various proponents believe evaluations should be conducted, Morris and Fitz-Gibbon's Centre for the Study of Evaluation (CSE) model went beyond the "how" to focus on the "phases during the development of a program during which audiences might effectively use credible information" (1978, 7). The purpose behind their model was to give people a common framework for thinking about and discussing evaluation. They viewed evaluation as part of an overall program planning process which included four phases: needs assessment,

program planning, formative evaluation and summative evaluation. The purpose of the needs assessment phase was to define the program's goals. In the program planning phase, a program to meet the needs determined by the needs assessment is designed or purchased. Because the last two phases, formative and summative evaluation, are implicit in the conceptual framework used for this thesis, they will be discussed in greater detail.

Formative Evaluation

Formative evaluation helps develop a program and conceptualize what the program is and how it works through the collection and sharing of information for program improvement. Formative evaluation occurs while the program is being developed, tested and improved. It plays a part in defining the program goals and objectives, design, and feedback mechanisms.

Ideally, formative evaluation occurs during the developmental phase of a program. The evaluator provides the program planners and staff with information to help adjust the setting and improve it. How the program looks and what progress is being made are types of information provided by a formative evaluation. This information can subsequently be utilized to develop or improve the implementation of the program in order to be as effective as possible in meeting its goals.

Summative Evaluation

Summative evaluation occurs after the fact, and looks at the total impact and overall value of a program. It differs from formative evaluation in its timing and audience, and may occur after the program has passed its developmental stage and is functioning as intended, or after the program has ended. The ultimate users of the results of a summative evaluation are usually authorities in a position to determine whether or not to terminate, continue or expand the program.

In a formative evaluation, the evaluator works with the staff and suggests improvements while the program is running; in contrast, the summative evaluator's function is to not interfere with the program, but rather to collect data and write a summary report showing the program's current status. Summative evaluation should also probe into reasons for effective or ineffective changes, conditions under which the program will not be effective and with whom, and an analysis of a range of intended and unintended effects. The evaluator must be free to report negative findings and to point to program features that seemed to influence success or failure.

Models of Evaluation

Over the past decade, various models of evaluation have been developed to, among other things, handle specific evaluation studies and define the evaluator's role. The model which is chosen to be used in a particular evaluation study depends on several factors: the nature of

the problem posed for the study; the specific needs of the client; the purpose of the evaluation; the environment in which the evaluation is to take place; the type of program being evaluated; the nature of the decision-making process relevant to the program; whether or not the evaluator will be forced to deal with retrospective data; the timing of the study; and whether the evaluation requires a summative or a formative approach. Many popular evaluation models have appeared in the literature in response to various combinations of the above factors. A brief overview of some of these models follows.

The Goal-Oriented or Discrepancy Evaluation model (Provus, 1971; and Bloom, Hastings, and Madaus, 1971) emphasizes the determination of whether or not a discrepancy exists between some aspect of program performance and program standards. The model serves both a summative and a formative function: Summative in that actual program performance is compared to intended or designed program performance and forms the basis of policy decisions; and formative in that the discrepancy information is used to change either program performance or standards as the program develops. This model is particularly successful if the evaluator has the support of program staff who set program standards and interpret discrepancy information.

The Decision-Oriented evaluation model (Ward, 1971; Guttentag, 1973; and Stufflebeam, 1971) is based on the premise that the evaluation should facilitate judgements by decision makers. The evaluation attempts to measure potential program outcomes by determining the utility of alternative program actions. Ward (1971) has developed a ten step

process for calculating the relative value or utility of each possible program action. This information is made available to the program decision makers who may then revise the program if needed in order to maximize utility or ensure the best possible outcomes. The model, thus, takes a formative approach to evaluation. In this model, the value judgements and preferences of the decision-makers are included in the data gathering process.

The Adversary Evaluation model is structured after a judicial proceeding (Kourilsky, 1973; Levine, 1973; and Wolf, 1975). In this approach, two evaluators present the case for two competing alternative interpretations of the program's value, both sides having access to the same information about the program. Decision makers are provided with favourable and unfavourable documentation and argumentation about the effectiveness of the proposed changes. This model is useful in situations where the decision-makers may be faced with strong opposing positions, such as those which may be faced by a school board. The model is designed such that the strengths and weaknesses of the proposed changes get equal airing, thus, hopefully reducing inadvertent or overt biases. The final decision rests with the decision-maker who has the responsibility for determining whether or not the strengths outweigh the weaknesses.

An underlying assumption of the Goal Free Model (Scriven, 1972; and Salasin, 1974) is that an evaluation should assess program effects based on criteria apart from the program's own conceptual framework. The evaluation looks at actual effects of the program rather than checking

for intended or alleged effects. In this model, the evaluator works with data collected by others and without prior knowledge of the program's goals and intents. Goal-Free evaluation is designed to remove any biasing effects which knowledge about the program's goals and relations with program personnel might have. This model may not be appropriate where it is important to assess achievement of goals or where discrepancies between goals and actual performances are important. However, this could be determined afterwards by going back and checking results of goal-free evaluation with original program objectives.

The Evaluation Research model was developed as a method of simulating experimentally designed scientific research, and compensating for the inability to randomize in a naturalistic setting (Talmage, Hughes, and Eash, 1978; and Cooley, and Lohnes, 1976). Here the focus of the model centers on the effects of a treatment, and the processes for implementing the treatment. Underlining this model is the assumption that evaluation must move beyond only the determination of anticipated effects, and be ready to account for both treatment and unanticipated or side effects. The evaluation should attempt to probe the combination of factors that contribute to the effects or that have explanatory power.

In Transactional Evaluation the assumption is that the evaluation should depict program processes and the value perspectives of the program personnel (Rippey, 1973; and Stake, 1975). The model's emphasis is on the continuous (formative) evaluation of the system, rather than the achievement of goals. The evaluator is seen as a part of the program responsible for ongoing changes, but only where program personnel are

enthusiastic and supportive of the change. He or she acts as a mediator when these changes may cause threats to some program personnel, and works toward achieving involvement of even those personnel resistant to change. Transactional evaluation improves organization efficiency, the potential for changes being implemented, and the quality of the evaluation, because the concern for human value leads to better relationships with those involved in the changes being made in the program.

Issues in Evaluation

Several issues exist surrounding the concept of evaluation including: what is meant by evaluation, why evaluations are needed, when they should be carried out, who should do evaluations, who evaluations should be done for, and how an evaluation should be conducted. The diversity of models in the literature has done little to clarify these issues. It is not surprising, for example, that researchers cannot agree even on a definition of evaluation. Evaluation has been defined as, for example: "a set of procedures to appraise a program's merit and to provide information about its goals, activities, outcomes, impacts and costs" (Fink and Kosecoff, 1978); "a process that includes measurement of goal achievement, feedback of information for adaptive decision-making, and examination of a wide variety of processes to determine why a program was or was not successful" (Reynolds, 1972); and "the collection of information about a program (what it looks like in action and the effect it is having) in a manner that is credible enough to make it potentially useful" (Morris and Fitz-Gibbon, 1978). These definitions imply various

needs for, or purposes of evaluation: to appraise a program's merit; to provide information about a program's activities, outcomes, impact and costs; to obtain feedback for adaptive decision making; to determine why a program was or was not successful; and to provide decision makers with information useful in planning future programming efforts.

Different theories exist as to when an evaluation should be carried out. It is the view of the researcher that the evaluation should be an integral part of the program planning and the administrative process. An evaluation may be carried out while the program is in process (formative) or after it has ended (summative), but needs to be done while there is still time to apply the results to the conduct of the program or to future program planning.

Controversy also exists concerning who should plan and carry out evaluations. Although formative and summative evaluations are different, in general, it is important that in each case the evaluator meet the needs of the ultimate user of the evaluation results. This is contingent upon arriving at clearly defined objectives, appropriate evaluation questions, and the attainment of a high degree of communication.

This is not to say that there are no systematic differences between the approaches, however. A formative evaluator should work closely with program planners, staff, and managers to determine the status of the program. In this sense, the formative evaluator is directly associated with the program. The summative evaluator, on the other hand, should remain uninvolved in the program except to make measurements. Because

objectivity and the need to possibly report negative findings are important aspects of a summative evaluation, they are often commissioned by agencies independent of the funders of the program.

The Conceptualization of Evaluation Developed for this Study

The models discussed earlier provide a wide spectrum of evaluation methodologies to cover many diverse program needs. It must be emphasized, however, that each model has advantages and disadvantages, and is most suitable to a particular set of circumstances. Certain situations may dictate that a combination of these models, or none of these, is appropriate. Since the model shapes the evaluation study, the evaluator must select the best fitting model on the basis of: the specific nature of the problem posed for the study and the questions to be answered; the specific needs of the client audience; the purpose of the evaluation; the timing of the study; and the nature of the decision-making process relevant to the program under study. In addition to these considerations, which form the context in which the evaluation occurs, the model utilized must also resolve the issues previously discussed including who does the evaluation, for whom is it done, and when, how, and for what purpose the evaluation is carried out. At times, as in the case of the study reported in this thesis, no one model may be suitable. A new model, or a combination of previously developed models, will, thus, need to be utilized. The following sections present the orientation adopted in the present context to accommodate the specific needs of the Nutrition at School decision-makers and the assumptions upon which the framework is based.

Assumptions

The basic assumption of the framework for this thesis is that evaluation is the attempt to clarify unambiguously what a program was planned to do, and what it actually accomplished. The study accepts that evaluation is inherently a part of the program planning process and is, therefore, closely related to the goals and objectives of the program. Whether or not the evaluator is aware of these goals and objectives when collecting data about the effects of the program, it will still be necessary to closely consider them at some point in order to determine how effective the program was or is achieving them.

Secondly, the approach of an evaluation may be either formative or summative or somewhere on a continuum between the two approaches. An evaluation may, for example, be summative in that it looks at the effects of a program, but formative in that the findings and suggested changes are utilized in a continuation of the program. Components of both approaches may be present in the same evaluation where the evaluator takes part in the planning process, implementation, monitoring of the program process and the determination of the outcomes and effects of the program. Alternatively, two separate evaluations, formative and summative, could be carried out on the same program.

Thirdly, the type of evaluation undertaken in a particular circumstance must fit the context in which the program being evaluated takes place. Since few programs are similar in all respects, a "workbook" approach can seldom be taken which would be applicable to all

circumstances.

Fourthly, it is assumed that fruitful interaction exists between the evaluator and the intended user of the evaluation as well as a mechanism for enabling an iterative approach to be taken. The means are available, therefore, whereby the evaluator can communicate findings and suggestions to the program decision-makers and receive suggestions from them. If management or decision-maker interests and authority are unknown, the evaluation findings may not be relevant to the decision-maker's real information needs, or the evaluation methodology may not be credible or acceptable to management.

It is also assumed that a program for which an evaluation is undertaken is evaluable; that the evaluation takes place within a climate or context which encourages the reformulation of program goals or objectives to facilitate evaluation at later stages. It is agreed that the "Goal-Free" evaluation model can be valuable in determining the actual outcome of a program by avoiding the biasing effects knowledge of the program's objectives may have. However, the writer views effective evaluations as closely linked to measureable program objectives and articulation of specific client needs. A program which is not structured in such a way that measurable program effects can be expected, may result in inconclusive and unreliable evaluation findings.

The Evaluation Framework

Before outlining in specific detail the evaluation model of the

present thesis, it is important to distinguish between two confusing and interrelated aspects of evaluation models, those being structures or stages, and processes. An evaluation "stage" is a general condition or series of steps that must be satisfied before an evaluation can continue. For example, the identification of program needs is usually a necessary precondition for an evaluation and could therefore be considered a stage of an evaluation methodology. The actual determination of the needs of the program, the program planner, or the decision maker, however, must proceed in a series of discrete steps that could be thought of as "processes". It is assumed in this thesis that stages are not optional, while how one goes about accomplishing the stages may vary in terms of process.

The evaluation framework developed for this thesis consists of four stages: evaluability assessment; articulation of management information needs; development of program objectives; application; and disposition stages. This framework is depicted in Figure 1. The framework begins with a request for an evaluation. This may come at the beginning of a program when it is in its initial planning stages, at any time during the program implementation process, or after the program or some phase of the program has ended. The request would likely come from someone within the program planning or decision-making process.

When a request for evaluation is received the request enters the first stage of the framework, the evaluability assessment stage. The purpose of this stage is to determine whether or not an evaluation should be done, if it is possible and feasible to carry out the evaluation, who

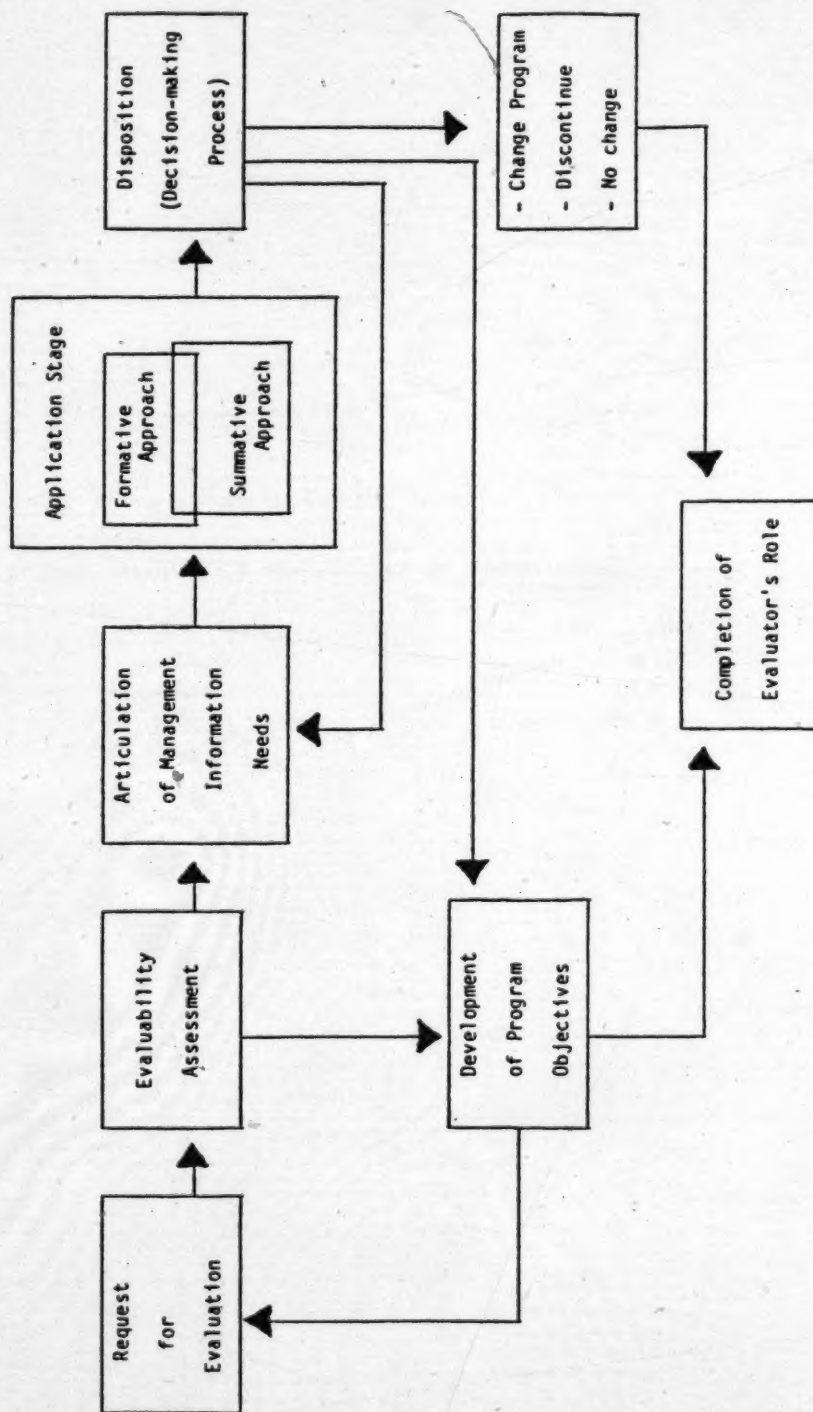


Figure 1

CONCEPTUAL FRAMEWORK OF EVALUATION STUDY REPORTED IN THIS THESIS

should do the evaluation and when. The evaluability assessment stage could include the following process:

1. Collecting program information that defines program objectives and underlying assumptions;
2. Developing a program model that relates program activities and objectives;
3. Analyzing the evaluable program model by determining whether or not the program has a set of measureable objectives and testable assumptions linking program activities to accomplishment of objectives; and
4. Determining whether or not those in charge of the program have the motivation, ability and authority to use the information obtained in the evaluation (Wholey, Nay, Scanlon, and Schmidt, 1975, 90).

The evaluability assessment stage determines the feasibility and likely utility of program evaluation. If this stage indicates the program is lacking in, for example, measurable objectives, the evaluator could work with the program personnel in redefining the broad program goals and objectives into measureable terms. The evaluability assessment stage could also include that which Ricks and Gilmour-Barrett (1977) have called an assessment of the organization's readiness for evaluation. This assessment would include: clinician readiness, administrative readiness, resource availability, organizational stability, and political climate.

Some controversy exists concerning whether the process of evaluation includes formulating a set of measurable program objectives or whether this task is part of the program planning process. It is this researcher's view that herein lies one of the major links between the program planning process and evaluation. Evaluation of program effectiveness is made extremely difficult unless intended impacts of the

program are stated in clearly measureable terms. An evaluation request which does meet the criteria of the "evaluability assessment" stage may, thus, move on to this stage, called "development of program objectives", if the program decision-makers should request assistance in the formulation of measureable program objectives.

Several techniques or processes have been developed and tested for building specific measureable objectives for program evaluation. An example is the Delphi technique (Dalkey, 1967) which was designed to elicit reliable consensus from a group of knowledgeable program personnel. The group are asked individually to generate a list of program objectives. These lists are edited and a revised set of objectives is returned to each participant, who reviews and adds or deletes objectives as needed. The process continues until consensus is reached on a comprehensive set of objectives. Each participant is also asked to assign weights to each objective and the process is continued again until program personnel have reached consensus concerning the objectives and their relative importance (weights). This technique, as well as others, requires close cooperation between the evaluators, planners and decision-makers. This stage of the framework may lead back to the "evaluability assessment" stage, and, hence to further stages if the criteria of that stage are met. Alternatively, the "development of program objectives" stage may not lead to further evaluation stages as the current needs of the program decision-makers may have been fulfilled.

A request which has met the criteria of the evaluability assessment stage then moves on to the next stage in this framework which involves

articulation of specific management information needs and the costs of obtaining the information. The specific problem to be addressed by the evaluation study and the questions which need to be answered would be formulated in this stage. It is important at this stage also to clearly define exactly what the evaluator's role will be and the purpose or use for the evaluation. Communication with the program decision-makers should be developed at this stage so that they know what will be expected of them in terms of resources and expertise, and so realistic expectations of what can be achieved by the evaluation can be formed.

The information needs of the decision-makers, the timing of the evaluation study, and the uses to which the information would be put, determine the approach the model will take in the application stage. The framework may take a formative approach if the evaluator is to become involved in developing the program process and in obtaining information at each stage. If the evaluation is formative, the evaluator should develop, in this stage, an effective feedback mechanism for management. The results obtained through the evaluation may, thus, be monitored and applied to the program decision-making process.

Alternatively, the evaluation could take a summative approach in the application stage. The summative evaluator would collect information on program effects and influences on program outcomes in response to the specific questions posed by the decision-makers. The data gathered on program effects compared to initial program objectives would provide the basis for the evaluator's assessment of the value and effectiveness of the program. Both the summative and formative stages of this evaluation

model entail the process of providing feedback to management on the effectiveness of the program in achieving program objectives. The specific processes which could be used in each approach of this stage depend on the context in which the evaluation occurs, the needs of the program decision-makers as defined in the articulation of management information needs stage and the questions identified for the evaluation, the phase of the program planning process in which the evaluation begins, the resources available to conduct the evaluation, and the skills of the evaluator. There are many different "how to" models available, some in workbook form, which detail step-by-step processes for carrying out both summative and formative evaluations. In many cases, these could be adapted to suit the particular needs and context of the evaluation to be conducted.

The results obtained in the application stage of the framework are handled in some way by the program decision-makers in the disposition stage of the framework. The result may be that new questions are identified by the decision-makers which they may request be examined in a further evaluation. This would lead back to the second stage of the framework: the articulation of management information needs. The disposition stage may alternatively lead to a change in some aspect of the program, a discontinuation of the program, or no change.

This model has many similarities to, and includes assumptions from, several of the models of evaluation previously discussed in this chapter. It has many similarities, for example, to the Decision-Oriented model in that it presumes that the goal of an evaluation is to facilitate

intelligent judgements by decision-makers and should allow them to continuously revise their program. However, the present view is that support and co-operation for the study can be gained without structuring the study on the value judgements and preferences of the decision-makers.

The Goal-Oriented Discrepancy evaluation model focuses on the determination of a discrepancy which may exist between some aspect of actual program performance and program standards. Although this present evaluation focused on the goals of the program there was no attempt to determine to what extent discrepancy existed. Similarities to the "Evaluation Research" model also exist. Both models assume that evaluation must move beyond the determination of anticipated effects alone and be ready to account for both treatment and unexpected or side effects. This study utilized open-ended questions to probe for behavior and reasons for program outcomes not anticipated by the program personnel.

Application of this Model of Evaluation to the Present Evaluation Study

The evaluation study reported in this thesis began with a request from the decision-makers (the Nutrition at School Core Committee) to evaluate certain facets of the program. This program, which had been in operation for seven years, had carried out an evaluation in 1976. Particular emphasis in that evaluation was on changed behavior, attitudes, and increased knowledge on its key audiences. The request for an evaluation of teacher involvement in the program was made to the author in the fall of 1979.

Nutrition at School met the criteria of the evaluability assessment stage. Program goals and objectives, as stated in Chapter 1 of this thesis, were clearly defined and measureable. Program activities were linked to these measureable objectives and were presented in such a way as to encourage teachers to apply them in unique ways within their own grade levels, classroom environments and lesson plans. The Nutrition at School Core Committee was enthusiastic, and had identified the purpose of the evaluation and the uses for which the results would be applied. The organization (in this case the Nutrition at School Core Committee) was deemed to be in a state of administrative readiness and organizational stability. Resource availability was ensured by a grant supplied to cover the costs of evaluation.

The articulation of management information needs stage in this evaluation involved identifying the specific questions which needed to be answered by the evaluation. Some questions had been formulated which, in the course of clarification of them with the program decision makers, led to the identification of other issues which they wished resolved. Several meetings were held to define specific needs and to determine which methodology would provide the most credible and useful information to assist them in making decisions. Examples of where decisions were reached through this iterative process included the areas of survey methodology, sample size, questionnaire construction, type of analysis and format of presentation of data.

In the application stage of the conceptual framework a summative approach was taken as the Nutrition at School Core Committee wished the

evaluation to assess the effectiveness of certain facets of the program in the previous four years. Although the program is a continuing one, it is only in a specific school for one year at a time, and thus may be thought of as a separate program. The summative approach was also chosen because the evaluation was to determine if the goals for teacher involvement in Nutrition at School had been achieved in the previous four years.

The specific processes which were used in the application stage depended upon the time and resources available, and the needs and wishes of the decision-makers. A mailed questionnaire was used to determine the extent of teacher participation in the year they were involved in the program, and in subsequent years. Teacher involvement included teaching of concepts, meeting objectives and using materials. Resources and time availability meant that only one questionnaire was sent. Due to the same restrictions, reaction to follow-up materials developed by Alberta Agriculture was assessed by written questionnaire. A detailed description of the evaluation application stage is included in Chapter Four.

At the conclusion of the summative evaluation, findings and possible implications were presented in a final report to the Nutrition at School Core Committee. In this disposition stage, the decision-making body for the program met with the evaluator to clarify results of the evaluation so that they could more easily incorporate the findings into the program decision making process. Although it is not known what changes were made, if any, it is assumed that the results helped to pinpoint areas

for improvement and assisted in the development of viable solutions.

REVIEW OF NUTRITION EDUCATION EVALUATION LITERATURE

Many nutrition education program evaluations have been conducted in the United States in the aftermath of the passage of Proposition 13 in California and efforts in other states to reduce taxes. Nutrition educators face the prospect of being challenged to account for their programs. Emphasis is, therefore, being placed on carefully thought-out evaluations to measure the accomplishment of objectives and implementation of the programs (Ullrich, 1978). One researcher (Jones, 1970), has pointed out, however, that national program objectives tend to be global, broad, and non-specific. For example, she notes that one nutritional program stated its objective as to "reduce the incidence of hunger and malnutrition among the poor". Jones explains that in order for a specific evaluation to effectively determine the relationship between the program plan and the real-world conditions of the program, operational objectives must be developed which are specific, but not constant. They must allow progressive refinement and modification, and have a basis for knowing when an objective has been achieved inherent within the statement.

Nutrition education program evaluations have, in general, focused on knowledge gained by students as a measure of the effectiveness of the program. Changes in food consumption and dietary habits have been measured less often due to the relative difficulty of monitoring food intake. In addition, the results of such studies have frequently been

discouraging. Head (1974) found that fifth-graders scored higher than did controls on a knowledge test, after a varied five-month nutrition education program, but did not appear to change dietary habits. Baker (1972) reported that fourth and fifth-graders who actively participated in nutritional learning experiences for three weeks gained knowledge and a better understanding of nutritional principles. However, only small changes in the nutritive and caloric values of their diets were observed.

Both the Head (1974) and Baker (1972) nutrition education programs used activities or resource ideas which were similar to those utilized in the Nutrition at School program in Alberta. In the program reported in Head's study, a one-week teacher workshop was conducted. Nutrition education was integrated into other courses including reading, mathematics, history, art, music and science. The teachers developed their own plans for integrating nutrition such as scrapbooks, skits, field trips and tasting parties. In Baker's program, consisting of thirteen, thirty-minute daily lessons, the students made growth charts, observed cells under a microscope, bent a decalcified bone, evaluated their diets, tasted squash and conducted experiments such as testing for starch with iodine and using blotting paper to detect fat. He concluded that "learning experiences involving active participation helped children attain stated objectives. Experiences that seemed least effective ...were those requiring children to classify foods according to relative caloric and nutritive values" (Baker, 1972, 56).

Several nutrition education evaluations have focused on the methods and resources used that were most effective as tools for teaching

nutrition. Kirk, Hamrick, and McAfee (1975) stated that appropriate educational methods and approaches can enhance the student's chance of acquiring nutrition knowledge. Manoff (1973) suggested nutrition educators take advantage of the mass media, such as television and radio, and begin using advertising and promotional techniques aimed at juveniles.

An example of such an educational approach was "Gulp", a fantasy-type comic developed as a nutrition education tool in New York state (Mapes, 1977). Intended for teens, "Gulp" was designed to be a more sophisticated and interesting approach than the Four Food Groups guide used for teaching beginning nutrition. To determine feedback on the new teaching method, 721 students and 26 professionals completed questionnaires on reading level, comprehension of message, design and format. The teens' reactions were generally enthusiastic, while the teachers felt the comic was informative, original and thought-provoking and could be used effectively as a nutrition teaching tool.

Another novel approach was developed by Meyers and Jansen (1977). They utilized a nutrient abacus and menu planner handbook developed by Colorado State University which focused on nutrients rather than food groups in teaching nutrition. An evaluation of the effectiveness of the unit was carried out by measuring scores on a test of nutrition knowledge administered before and after the unit was used for three weeks in the fifth grade. Results demonstrated a significant improvement in test scores for all groups exposed to the nutrition unit although the authors caution that it is questionable whether a three-week unit would, in fact,

effect long-term dietary behavior modification. The value of the nutrient abacus approach, like the "Gulp" comic, lies in its ability to stimulate student interest and motivation.

Several researchers have found films to be effective tools for teaching nutrition to young school children. A popular nutrition film series which was utilized in the Nutrition at School program in Alberta was the "Mulligan Stew" film series. "Mulligan Stew" is a series of six nutrition education programs aimed primarily at 9 to 13 year olds. The programs include half-hour films, teacher-leader guides, and student workbooks. They have been scheduled throughout the United States by 4-H television co-ordinators.

In Wisconsin, the films were shown to 140 fourth-graders in two cities prior to state-wide viewing in order to evaluate the effectiveness of the films and supplementary activities as a method of teaching nutrition (Jenkins, Stumo and Vorchick, 1975). Changes in nutrition knowledge and dietary intake were measured by written tests before and after the program. Results indicated that children who viewed the films and participated in the activities increased their knowledge of nutrition significantly more than did the control groups. However, the dietary study showed nothing conclusive. Similar findings had been reported by Shapiro, Bale, Scardina and Cerva (1974) who evaluated "Mulligan Stew" in six states using a pretest-posttest method. To supplement these earlier studies, Williams, Aleong, Merrow, and Morse (1980) attempted to determine if "Mulligan Stew" might be an effective teaching tool with grades 2 and 3 as well as the recommended target group of 4 through 6.

Using one pretest and two posttests administered to 427 students, they found that the film series "resulted in a significant increase in the nutrition knowledge of both sexes in grades 2 to 3 as well as grades 4 to 6 from a rural population, and that the information was retained for six months" (Williams, et. al., 1980, 261).

Both the Williams and Jenkins studies noted that television viewing is popular with children, and these films, which can be used on television both in and out of school, would be highly appropriate for television programming. Jenkins also made the observation that the "often negative influence of television food advertising on children's eating behavior make it especially important to utilize this medium to teach accurate nutrition information" (Jenkins, et.al., 1975, 19).

Sodowsky (1973) reported another method for encouraging greater integration of nutrition in the school curriculum. She developed an inservice workshop for elementary teachers to review nutrition information and investigate innovative teaching techniques, determine the needs and promote understanding of the elementary teacher in relation to nutrition education, and evaluate the degree to which nutrition education techniques were accepted and used by the elementary school teacher. The study indicated that teachers may desire to motivate students to choose food wisely, and also be interested in innovative and creative methods for teaching nutrition. At Sodowsky's workshop, for example, suggestions were given for integrating nutrition into other subject areas in addition to health and physical education. The teachers who attended utilized many of the ideas in language arts, science and communicative arts

classes. In her evaluation, conducted five months after the workshop, she found that teachers used films and puppet shows extensively, as well as the "Big Ideas" program of the Dairy Council of California (Sodowsky, 1973). Sodowsky recommended that basic nutrition information and innovative methods of teaching be required for certification of elementary school teachers, and that curriculum guides be developed which would include the sequencing of nutrition education for grades K to 12.

While Sodowsky's study placed emphasis on the role of the teacher in the implementation of nutrition education, other studies have noted that teachers may desire to teach nutrition in their classroom, but do not know how to deal with it as a subject (Cooper and Philip, 1974). They either find it too complex to simplify for the primary child or lack the ideas and activities to make it interesting and relevant. The teacher's influence is important however in forming children's attitudes towards nutrition (Baker, 1972). It is necessary, therefore, that evaluations of nutrition education programs consider the teachers' role in addition to the effects of the program on student knowledge and behavior. An evaluation must also be carried out within the context in which the program takes place, and be part of the total program planning and implementation process.

The evaluation reported in this thesis examined the involvement of teachers in an established nutrition education program. Various elements were found to affect the teacher's implementation of concepts and teaching objectives and their use and evaluation of resource materials. These elements comprised the teaching environment in which the program

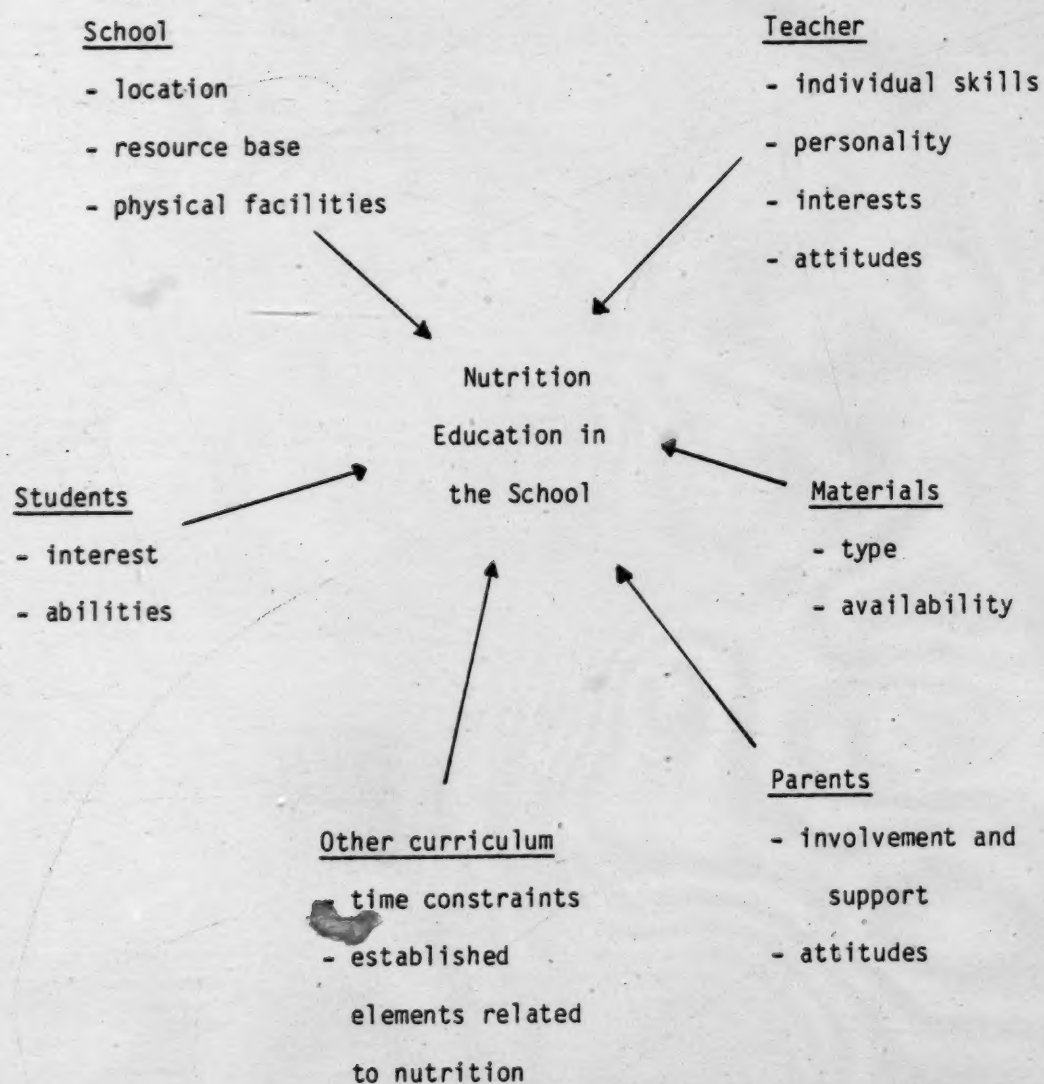
took place.

The Teaching Environment

Several evaluation studies (Humphreys, 1971; Cooper and Philip, 1974; Cook, Eiler and Kaminaka, 1977; and Yinger, 1980) focused upon various elements within the teaching environment which may influence what is taught. The elements that have been researched include teacher in-service education, number of years of teaching experience, grade level taught, teachers' perceived importance of the subject matter, teaching degree held, school administrative supports, school location (urban/rural) and school enrollment. Eboch and Stufflebeam (1974,75) suggested that information referring to the context of educational programs is important. Context information was defined as "that data which describes with some accuracy the total setting of the educational situation." Dunkin and Biddle (1974) elaborated on specific contexts applicable to studies of classroom teaching. These contexts included the teacher, the pupil, the classroom, the school and the community. Mackay and Maquire (1971,19) noted further that "objectives and content are not the only characteristics that are pertinent to curricular decisions; costs, effects on teacher workloads, ease of implementation, social importance and appropriateness of teaching method are only a few of the value-laden variables that are important for teachers, school boards and the public to know about". Identification of these contexts or elements of the teaching environment thus serves to assist in the understanding of teacher variation in the implementation and evaluation of nutrition education programs. These elements, illustrated in Figure 2, affect

Figure 2

Some Elements in the
Teaching Environment Which
Affect Nutrition Education
in the School



which nutritional concepts are taught in the classroom and which teaching objectives are met, how much time is devoted to nutrition education, which nutrition resource materials are used, what special nutrition related activities take place in the school, and what is done in terms of follow-up to the Nutrition at School program.

Other elements in the teaching environment may have different characteristics which influence if and how nutrition education is taught. For example, teachers may vary in their interest, previous training, and flexibility in incorporating nutrition education into their lesson plans. Head (1974) noted that commitment of the teacher to nutrition education was an important factor in the success of the nutrition program. Also, Williams, Aleong, Merrow, and Morse (1980) found that all teachers do not have the same interest and enthusiasm necessary for teaching nutrition.

Schools may differ in the flexibility of their schedules and the support given to teaching nutrition education. Head (1974) reported that the program she evaluated was more successful where administration was committed to the importance of nutrition education in the school. In addition, Chethik (1974,133) noted that "the way an individual teacher evaluates his or her ability to teach the subject and the view of the school administration on including the nutrition unit in the curriculum ultimately define the curriculum". The availability of materials to a school may vary as well as the complexity, effectiveness and usefulness of materials. The total number of subjects taught at a particular grade level influences what is taught by teachers, as a decision must be made

among the many alternatives that could be fit into their classroom lesson plans.

These studies contain just a sample of the many elements which all interrelate to affect what nutrition education takes place in a classroom. In this thesis, information was obtained from one of these elements only, that of the teacher. It was specifically designed to provide an understanding of teachers' perceptions regarding the Nutrition at School program.

Past Evaluations of the Nutrition at School Program

The Nutrition at School program is based on concepts adapted from the program "Big Ideas in Nutrition Education and How to Teach Them" which was developed by the Dairy Council of California (1970). Lovett, Barker, and Marcus (1970) researched these materials in a study consisting of pretesting the students involved in the research, teaching them a nutrition course of approximately one hour per day for three weeks, and posttesting them to determine the results. It was found that the program was effective in improving the students' nutrition knowledge, applied knowledge, and behavior towards nutrition. On the basis of the Lovett study, the Ontario Milk Marketing Board introduced the "Big Ideas" program.

The Ontario program consisted of locally held nutrition education workshops for teachers of grades K to 3. The three-hour workshops stressed an activity-oriented approach to nutrition education and were

designed to provide teachers with the basic nutrition information they require to teach nutrition. Since teacher participation in the workshops was voluntary, the teachers were under no obligation to implement the program in the classroom. Cooper and Philip (1974) conducted an evaluation of the effectiveness of these workshops. Among other variables, they measured the number of teachers who implemented the nutrition program in the classroom following workshop attendance, the extent to which they covered the objectives, and the effectiveness of the program in adequately preparing them to teach nutrition. In addition, they looked at the effect of school board reinforcement as a factor in the stimulation of teacher interest in attending workshops, which could have some effect on their attention to nutrition in the classroom.

The Cooper and Philip (1974,103) study found that:

"over 70% of the teachers began teaching nutrition in the classroom following workshop attendance. However, the extent to which the teachers covered the workshop objectives varied, both in the number of objectives covered and the degree of coverage for each objective. The teachers from an area where the school board strongly endorsed the program covered the objectives to a greater extent in both breadth and depth".

As a result of this study, the Ontario program was revised to place greater emphasis on core areas. The number of program objectives were reduced from nine to four and included food identification, food classification, balanced meal selection and the relationship of food to growth and health. The resource materials were also changed to be entirely Canadian in content, and a program for teachers of grades 4 to 6 was developed.

The Nutrition at School program in Alberta was modeled after the Ontario program using the teacher workshops, the four core teaching objectives, the activity-oriented approach, and the resource materials developed by the Ontario Milk Marketing Board. In addition, Alberta added the food sample program to Nutrition at School.

Past evaluations of the Nutrition at School program in Alberta were descriptive studies designed to assess the program's effectiveness in achieving its goals. At the conclusion of the 1974-75 program, short questionnaires were distributed to parents, teachers and students. Results indicated that "a vast majority of the parents and teachers were in favour of the program and that 51.4% of the parents indicated the program had changed their child's eating habits. Ultimately a change in eating behavior as a result of increased knowledge was an important long range goal and it appeared that the program could be effecting such a change" (Harvey and King, 1977). In addition, most teachers indicated that they found it easier to teach about nutrition when food was served. This lent further support to the concept that nutritious food samples were a vital part of this program and a vehicle to nutrition education.

To further assess the program's effectiveness, Harvey conducted an evaluation "directed towards identifying and measuring the impact of the various program interpretations on key audiences" (Harvey, 1976, 1). The key audiences studied were parents, teachers, students and principals. The three forms of the program during the 1975/76 year were: nutrition education plus food samples; nutrition education only; and intensively-resourced nutrition education. Schools were drawn for each of these

groups plus a fourth group of control schools with no exposure to the program. Questionnaires were designed to test nutrition knowledge, to measure response concerning attitudes toward nutrition, and to identify selected nutrition-related behaviors.

In general, Harvey found that the food sample-nutrition education approach was most successful in grades 1 and 2 in contributing to increased nutrition knowledge as well as producing a climate for developing approach behavior towards nutritious foods and avoidance behavior of non-nutritious foods. The results, however, supported the concept of nutrition education without food samples when necessary, especially in grades 1 to 4.

Results of Harvey's study which are relevant to the evaluation reported in this thesis related to teachers and their implementation of the program. "Many teachers did not have enough time to teach all objectives and a majority of teachers did not find the objectives easy to teach". In addition, "The evaluation of the adequacy of the objectives in meeting student needs revealed some problems with the complexity of Objectives 3 (Selection) and 4 (Function) for Grade 1. Otherwise, the objectives were judged to meet the majority of student needs in two thirds or more of the classes. There was less consensus on suitability of objectives for grades 4 to 6 than grades 1 to 3" (Harvey, 1976,121). The study also examined teacher use of resource materials and found usage of suggested activities was relatively low in all grades. This included use of learning activities in the "Big Ideas" package and other special resources. The film used most frequently and rated highly was the

"Mulligan Stew" film and the accompanying comic book. In conclusion, Harvey suggested that further work could be done to help teachers relate the objectives to their teaching priorities; revision of objectives should be undertaken with priority given to Grades 4 to 6; and alternative formats for suggested teaching activities should be explored.

Fodor (1979) compared two methods of nutrition instruction used in the Nutrition at School program in 1975/76. One treatment group received the "Big Ideas in Nutrition Education" package plus food samples. The other treatment group were taught using the "Big Ideas" approach and numerous multi-media learning activities. Fodor commented on the availability and nature of various resource materials as an important element. "Good resources tend to be novel, easy to prepare and present, motivating to students, and enjoyable to both student and teacher. Snack foods as resources can provide for each of these requirements, while other resources may not ...The physical properties of films, games, books and models cannot be manipulated to the same extent. Once used, many of these lack their interest or novelty effect" (Fodor, 1979,60). It was suggested that teachers may lack the time or inclination to seek out presentation alternatives and recommended that "teachers should have easy access to resource material. Supportive audio-visual packages could be placed in school libraries so that they are more easily accessible. This would eliminate the need to have to order or wait for these materials" (Fodor, 1979, 63).

Both the Harvey and Fodor studies illustrated the importance of structuring the concepts and teaching objectives so that they are suited

to the grade level intended and are easy to teach. The suggested activities and resources also should be easily adaptable to individual teaching styles and to use with the different concepts and teaching objectives. Yinger (1980) illustrated the fact that teachers differ in the materials and activities they use, even at similar grade levels in the same school. Teachers involved in the Nutrition at School program should, therefore, be encouraged, within the framework given, to implement the program in a unique way.

In addition to these evaluation studies of the Nutrition at School program in Alberta, a teacher evaluation form had been designed by Alberta Agriculture to be used at the conclusion of the teacher workshops. This evaluation form was not used at all workshops, possibly due to the fact that in the past this, and similar evaluations, tended to yield only positive results. Also, there was no clear policy regarding the use of evaluation forms in the teacher workshops. Student evaluations consisted of small quizzes and exercises included in the "Big Ideas" kits. These were used at the discretion of the individual teachers and no records were easily available as to the results obtained.

Past evaluations of the Nutrition at School program have examined both use of resources and effects on knowledge and attitudes towards nutrition. These studies are useful in developing an effective program for teaching nutrition. Other researchers have looked at the role of the teachers in delivering nutrition education and have examined methods of stimulating teacher involvement. Nutrition education programs have,

therefore, focused on knowledge gained by students and changes in food consumption and dietary habits as a result of a specific program, usually one of a short duration. Others have focused on activities or resources which could be utilized in teaching nutrition. This study is an attempt to add to this body of knowledge of teacher involvement in teaching nutritional concepts and using various resource materials. The next stage in the development of nutrition education evaluation theory should be to draw the many approaches together, illustrate the influence of the different elements in the teaching environment and formulate methods to best utilize the resources offered in this environment to meet the goals of effective nutrition education.

EVALUATION DESIGN

Introduction

A descriptive survey method was employed for this evaluation study. This chapter describes the evaluation design in detail, including the sampling design and measurement instruments, return rates, survey methods, and the analysis conducted.

Sampling Design

The sampling unit for this study was teachers who had been involved in the Nutrition at School program in one or more of the school years from 1976/77 to 1979/80, in Calgary, Edmonton Separate and rural Alberta schools. Rural Alberta schools were defined for this study as all schools outside of Calgary or Edmonton. Edmonton Public Schools were excluded from this study because they had been exposed to other nutrition education programs in addition to the Nutrition at School program. It was felt that inclusion of the Edmonton Public school teachers in the sample would result in contamination as they may have had difficulty in clearly distinguishing between programs.

The sample was selected from lists of teachers provided by Alberta Education. Any school name and its list of teachers for any given year could be produced by providing an appropriate computer code number for

that school. In order that a sample of teachers could be drawn from a list of only those teachers who had been involved in the program, computer code numbers for those schools that had been on the Nutrition at School Program from 1976/77 to 1979/80 were taken. Code numbers for Calgary schools on the program in 1976/77 to 1978/79 could not be taken as the names of these schools were not available at the time. These names were provided by the Calgary Nutrition at School Coordinator at a later date. Alberta Education also provided the names of teachers for the code schools for both the year the school had the Nutrition at School program and for 1979/80. As a result, teachers teaching in the school when it was on the program, and still teaching in the same school, could be separated from the others. This sorting was done to minimize non-completion of questionnaires due to teacher movement from school to school.

The sampling design had several limitations. An attempt was made to obtain information which would allow identification of only those teachers in the schools who were directly involved in teaching grades K to 6 and, hence, involved in teaching nutritional concepts and using nutritional resource materials. This information, however, was not available as the Alberta Education data did not include grades the teachers taught. As a consequence, it is likely that many questionnaires were received by school principals, librarians, nurses, resource room teachers, or others who may have been listed as staff in the information provided by Alberta Education, but who could not be separated from the rest of the teachers for sampling. It is probable that this sampling limitation had an effect on the return rate,

because teachers not directly involved in the program and who had not attended a Nutrition at School teacher workshop would be less likely to respond than others. Data was also not available on the size of the schools, or the grades taught in the schools. As a result, sampling by grade and size of school could not be done as was originally intended.

Sampling, therefore, only involved separation between Edmonton Separate, Rural, and Calgary schools. The number of teachers randomly selected from the rural and urban schools for each year of involvement in the program was determined by a proportional allocation based on the total number of teachers available in each group. This means that the number of teachers selected for the sample for each year and for each location depended upon how many teachers were available who had been involved in the Nutrition at School program in that year and were still teaching in the same school. A total of 4,417 teachers were available to be sampled from. These were all the teachers who had been involved in the program in at least one of the years from 1976 to 1980 in Edmonton Separate, rural Alberta, or Calgary schools, and who were still teaching in the same school (based on the information available). A sample size of 500 teachers was requested by Alberta Agriculture, as they felt a smaller sample would result in less credible results. This sample size represented 11.3% of the total number of teachers available. In order to select a sample which was proportionally allocated to each location group and each year, approximately 11.3% of the teachers available in each group were selected. For example, in the school year 1977/78 in rural Alberta,

523 teachers were identified who had participated in the Nutrition at School program in that year and who were still teaching in the same school. Of these 523 teachers, 59 or 11.3% were selected for the sample by randomly selecting a starting point from the list of teacher names and taking each ninth name after that point. Table 1 summarizes the results of the sampling design.

Table 1
Sampling Design

	Edmonton Separate		Calgary		Rural	
	No. available	Sample size	No. available	Sample size	No. available	Sample size
1976/77	52	4	40	5	425	49
1977/78	39	6	119	13	523	59
1978/79	91	10	223	29	750	85
1979/80	92	10	239	27	1824	207
Total	274	30	621	74	3522	400

Measurement Instruments

The main measurement instrument for this study was a questionnaire developed in conjunction with the Nutrition at School Core Committee to assess as closely as possible the issues of concern identified by the Committee. The final questionnaire, thirteen pages in length, consisted of four parts. Part One of the questionnaire obtained information about the teacher's involvement in the Nutrition at School program, attendance at Nutrition at School teacher workshops, grades taught by the teacher, size, and location of the teacher's school, and grades taught in the school. Part Two asked what nutritional concepts were taught, and what teaching objectives were met, of those listed in the "Big Ideas in Nutrition Education" curriculum package given to the teacher at the Nutrition at School teacher workshop.

Part Three, sections A and B, dealt with use by the teacher of the nutrition education resource materials received at the teacher workshop, and the effectiveness of each of the materials in teaching nutritional concepts. In Part Two and Part Three (A) and (B), teachers were asked to respond only to those concepts, teaching objectives and nutrition education resource materials pertaining to the grade levels they taught, for either grades K to 3 or grades 4 to 6. Part Three (c) obtained information on use of other resources, in addition to the materials received at the Nutrition at School teacher workshop, and difficulties, if any, experienced in obtaining these resources. The teachers were also asked reasons why any materials received at the teacher workshop were not used, what type of materials they would like to see provided in

a "follow-up" to the program, and what steps they took to avoid repetition of the materials for students moving from one grade to the next. The questions in Parts Two and Three of the questionnaire pertained to both the year in which the teachers were involved in the Nutrition at School program in their school, and in each of the years following.

Part Four consisted of questions related to the other issues concerning "follow-up" to the program, besides those first identified by the Nutrition at School Core Committee. The questions included how often the teacher felt children should be exposed to nutrition education in the school, how long the "Big Ideas in Nutrition Education" materials were useful after the food sample program ended, and about the teacher's perception of the usefulness of various types of materials for teaching nutrition education in the classroom. Lastly, the teacher was asked what follow-up activities took place in his or her school following the school's involvement in the Nutrition at School program.

A second questionnaire was developed to obtain the reaction of teachers to the four follow-up units developed by Alberta Agriculture. The questions were developed to allow the teacher to assess the educational significance of the units (i.e. reinforcement of learning of nutritional concepts, suitability to activity types and grade levels, and ease of integration into classroom curricula). In addition, the perceived usefulness of the units was compared to other possible ways Alberta Agriculture might provide follow-up to the Nutrition at School program. This questionnaire was not designed to obtain any indepth

analysis of the educational significance of the units or teacher's perceptions of their usefulness. The emphasis, as requested by the Nutrition at School Core Committee, was on obtaining initial reactions to the follow-up units from as many teachers as possible. Although more indepth analysis by a small group of teachers in a group interview situation, for example, may have yielded very useful information, in view of the tight time lines it was considered not feasible for this evaluation.

Since four different units had been developed, four separate questionnaires regarding these units were developed. The only difference in the four questionnaires was the different objectives stated for each unit. Each teacher selected to review one unit received the questionnaire corresponding to that unit.

During pilot development of the questionnaires a great deal of feedback was obtained from some members of the Nutrition at School Core Committee, members of the Alberta Agriculture Planning and Research Secretariat, faculty and graduate students in the Home Economics Faculty of the University of Alberta, and teachers at St. Justin Catholic School in Edmonton. All suggestions and comments were carefully considered. While many were incorporated into the final questionnaires, other suggestions could not be used as they either meant the questionnaires would be too lengthy and time consuming for the teachers to do, or they did not reflect the research questions to which the study was addressed. A main concern at this time was keeping the questionnaire to a reasonable length. The Edmonton and rural Alberta teachers received

their questionnaires in June, perhaps the busiest time in the school year. The Calgary teachers also received the questionnaires at a stressful time as the teachers' strike was just over and there was, undoubtedly, a backlog of work to complete. Hence, the need to have a questionnaire which was not time consuming to complete.

The final questionnaires are included in Appendix A. All teachers in the sample were mailed the main thirteen page questionnaire. In addition, 160 teachers from the original sample received a follow-up unit for review and evaluation along with one of the four unit questionnaires. Forty copies of each of the proposed four units were duplicated, giving each teacher only one to evaluate.

Reliability and Validity of the Measurement Instruments

An instrument is reliable if respondents answer it consistently over time providing they feel the same way at each time of responding. Instruments which are lengthy and internally repetitious can be tested for reliability, but such instruments were not considered of high enough appeal to elicit satisfactory numbers of responses in this evaluation. Also, due to the busy schedules of the teachers, it was considered necessary to make the questionnaire as short as possible while still obtaining the needed information. The careful stages of development in arriving at the final questionnaires probably contributed to reliability. However, no formal measures of reliability or validity were conducted.

In this study, one reliability concern was the use of retrospective data regarding teachers' attitudes and behavior over a four year period. Lapses and distortions of respondent memory are major causes of unreliability. Finney (1981) noted that efforts to minimize this problem have focused on various techniques of measuring reliability, improving questionnaire construction and interviewing methods, scale construction, and standardizing coding procedures. In order to best measure change over time via survey questions, he proposed use of questions or variables that are less vulnerable to recollective loss or distortion than others. The following kinds of materials have been found by various researchers to be more reliably recalled than others: personal, factual information more than subjective, attitudinal or less personally relevant factual information; materials which are congruent with one's own values; and plausible more than implausible information (Finney, 1981, 209). In this study simple, objective questions were utilized rather than complex, subjective ones in an attempt to increase reliability. In addition, respondents were asked to give factual information about only their own teaching involvement in the Nutrition at School program. Although the questions asked related to plausible information (achievement of basic teaching objectives, use of materials, etc.), it may be that considering teachers were being asked to remember, for example, use of a specific nutrition education resource material up to four years previous, some questions of reliability remain.

Validity refers to whether or not a measuring instrument actually measures that which it is intended to measure. Validity is a crucial concern in behavioral research because it is impossible to obtain direct

measures of human behavior; instead it is necessary to use indirect means of measurement which are consequently subject to various sources of error. Face validity refers to whether the measure appears to correspond to the concept presumably being measured. Content validity refers to whether or not the measurement instrument adequately measures all relevant dimensions of the concept. In this study the instruments and procedures were validated through pilot testing and expert review. The pilot test assessed whether or not certain words or questions in the instruments were redundant or misleading, if the questions were readable, and if the questionnaire provided the intended information. Members of the Nutrition at School Core Committee were consulted when designing the questionnaire as a method of checking face and content validity.

Mailing Dates

Introductory letters were sent to all superintendents and principals of those schools which had been involved in the Nutrition at School program in any of the past four years. These letters, introducing them to the study and soliciting their assistance, were sent out during the last week of May, 1980.

Questionnaires were code numbered and mailed, including addressed, postage paid return envelopes and introductory letters to teachers randomly selected for the sample. The questionnaires, including the 160 units and their questionnaires, were mailed June 9, 1980. Because of a teacher's strike in Calgary, a second introductory letter and question-

naires for the Calgary sample were not mailed until November, 1980.

Follow-up letters were mailed on June 20th to the 305 teachers who had not returned their questionnaires by June 19th. In addition, all the Edmonton sample were telephoned requesting them to complete and return their questionnaires. Follow-up letters were also mailed to those of the Calgary sample who had not returned their questionnaires by December 12, 1980. A sample of each of these letters is included in Appendix B. In addition, in order to obtain a comparable return rate as from the earlier sampling, a telephone reminder was conducted by Alberta Agriculture.

Return Rate on Questionnaires and Reasons for Non-Return

Considering the busy times of year for teachers in which the questionnaires were mailed, there was a high rate of return. Of the 504 main questionnaires mailed out, 267 were returned. Included in the 267 questionnaires returned were 30 that were not completed. Some teachers had returned them with notes stating why they had not filled in the questionnaires. The remaining 237 usable (completed) questionnaires represented a return rate of 47%. A return rate of 50% is considered good for survey studies of this kind especially considering the fact that the questionnaires were sent out at very busy times in the school year and to a sample which included, due to sampling limitations, non-teachers and teachers who had not been directly involved in the program.

From notes on uncompleted, returned questionnaires, and phone calls and letters from teachers who did not return their questionnaires, some deductions can be made about why many of the questionnaires were not returned. The main reason for non-return is related to the method used to collect the sample. When the sample was selected, it was done without any knowledge of the grades taught in the schools from which the teachers were randomly selected, or of the grades the individual teachers taught, because this information was not available. As a result, many of the teachers who received a questionnaire had not been directly involved in the Nutrition at School program, although their school may have been. These teachers were principals, resource room teachers, junior high teachers, or specialized teachers without a classroom who taught only music, French, remedial reading, etc. In addition, some teachers had only been teaching a few months and, consequently, had missed being involved in the program in their school, while others simply stated that, because they did not teach "health", they were unable to answer the questionnaire. A few teachers, commented on the poor timing of the study. They noted that they could have spent more time on the questionnaire if it had been received at a less stressful time. It can be assumed that some teachers were unable to find the time to fill in the questionnaire at all for this reason.

Unit Questionnaires

The return rate on the questionnaires concerning the follow-up units was 35%. Of the 177 questionnaires sent out, 62 usable questionnaires were returned. This lower return rate can be attributed

to the fact that the teachers were busier than usual in the last month of the school year and following the teachers' strike. The teachers were asked to read and think about the material in one of four follow-up units which averaged 32 pages. They were asked to evaluate the questionnaires by answering a detailed four-page questionnaire. The availability of time, therefore, may have been an important factor in whether or not the unit questionnaires were answered.

Telephong Interviewing

Originally a sub sample of 20 teachers was randomly chosen in addition to the larger sample, for telephone interviewing in order to probe to see if anything was missed in the written questionnaires. The aim was to obtain more data, if possible, especially on the open-ended questions. Due to a concern that the response rate on the mailed questionnaires might be low, the number of telephone interviews was made as large as budget would permit. Three interviewers were trained, one of whom was very familiar with the Nutrition at School program. Thirty-seven telephone interviews were completed. The final number of respondents and return rates is presented in the following table:

Table 2
Number of Respondents and Return Rates
for Main Questionnaire and Unit Questionnaire

	Total Number (percentages in parentheses)
<u>Main Questionnaire</u>	
Mailed:	
Sent Out	504
Usable Returned	237 (47%)
Telephone Interviews:	
Number Completed	37
Total Numbers of Respondents to main Questionnaire (including telephone interviews)	274
<u>Unit Questionnaire</u>	
Mailed:	
Sent Out	177
Usable Returned	62 (35%)

Analysis

In order to answer the questions posed for this evaluation, a descriptive analysis was selected. Frequency distributions and percentages by year of involvement in the program and by location of school were carried out. Crosstabulations were also done of year of school involvement and school location by selected variables. Further analysis such as tests of significance or of proportions were not carried out as it was understood that the requestors of the evaluation considered additional statistics to be neither appropriate nor needed at that time.

REPORT OF FINDINGS OF THE STUDY

This chapter reports the findings of the evaluation with summaries of the data in written and tabular form. The findings are organized by the questions initially posed by the Nutrition at School Core Committee. Summaries of the major findings, a discussion of these findings and their implications for the Nutrition at School program are presented in Chapter Six.

Description of Sample

A total of 274 teachers responded to the study. Of these teachers, 36 taught in Edmonton, 43 in Calgary, and 239 in rural schools. Table 3 reports the participation by year of these teachers. Comparing the sample size of 274 and the number of teachers who indicated being involved in the program (318), it is evident that forty-four teachers were involved in the program for more than one year. Teacher's attendance at the Nutrition at School teacher workshops was approximately 83% for both Edmonton urban and rural teachers involved in the program. Slightly more Calgary teachers (87%) had attended the workshop.

Of the 274 teachers who responded in this study: 271 gave

Table 3

Participation Record of Sampled Teachers by
Year and by Location of School
(Percentages shown in Parentheses indicates
percentage of all teachers who responded in
the given year)

Year of Teacher Involvement	Edmonton ¹	Rural ²	Calgary	Total number of teachers involved in program in that year who responded
1974 /75	0	3 (100.0)	0	3
1975 /76	1 (11.1)	7 (77.8)	1 (11.1)	9
1976 /77	7 (18.4)	26 (68.4)	5 (13.2)	38
1977 /78	8 (20.5)	27 (69.2)	4 (10.3)	39
1978 /79	7 (9.7)	53 (73.6)	12 (16.7)	72
1979 /80	13 (8.3)	123 (77.3)	21 (13.4)	157
				TOTAL ³ 318

¹ Edmonton sample comprised of separate schools only.

² "Rural" location schools are comprised of all schools outside of
Calgary or Edmonton.

³ Sample size N = 274.

information about the location of their school; 262 concerning school size; and 270 about which grades were taught in their school. Table 4 summarizes the school characteristics. As previously reported, no teachers in the Edmonton public schools were included because another nutrition program was in effect that may have confounded the results. The emphasis on rural schools reflected as closely as possible the participation levels of rural/urban schools in the program. In addition, the number of teachers responding from schools of different sizes closely reflects the total estimated number of schools in each size category of schools in the total province.

Findings Related to Teachers' Involvement in Teaching Nutrition Education While the Nutrition at School Program was in the School and in Subsequent Years

The third main goal of the Nutrition at School program was: Teachers of elementary school children will include nutritional concepts in their classroom curricula. Although not stated as such, it was also hoped that involvement in the Nutrition at School program, and participation in the teacher workshop, would motivate teachers to continue to incorporate nutrition into their teaching after the program ended. This section presents findings related to issues number 1 and 3 identified by the Nutrition at School Core Committee:

1. In the year in which teachers participated in Nutrition at School teacher workshops, did teachers include nutritional concepts in the curricula?
3. In subsequent years, following the teachers'

Table 4

Nature of Schools of Respondents Involved in
the Nutrition at School Evaluation Study

	Number of Teachers from each School Type	Adjusted Percentage ¹
Location:		
Urban (Edmonton)	24	8.9
Urban (Calgary)	39	14.4
Rural	208	76.7
Size of School:		
1 - 200 students	82	31.3
201 - 400 students	88	33.6
401 - 600 students	76	29.0
601 - 800+ students	16	6.1
Grades Taught in School:		
Early elementary ²	21	7.8
Elementary ³	137	50.7
Late elementary ⁴	6	2.2
K - 12 ⁵	106	39.3

¹On all tables in this report the percentages reported are based on valid responses to questions on the questionnaires. That is, all missing and non-applicable responses were excluded from percentage calculation, which are reported as adjusted percentages (adj.%).

²Includes grades: K-2, K-3, 1-4, 1-3

³Includes grades: 4-6, K-6, 1-6, 1-5, 3-6

⁴Includes grades: 4-12, 4-6

⁵Includes grades: 1-10, 1-8, K-12, 1-9, 1-12, K-8, K-7, 1-7

participation in Nutrition at School teacher workshops, did teachers continue to include nutritional concepts in their curricula?

Teachers who attended the Nutrition at School teacher workshop were each given a curriculum package called "Big Ideas in Nutrition Education" suited for the grade level(s) they taught, either grades K to 3, or 4 to 6. The teachers were encouraged to teach each of the two nutritional concepts listed in their "Big Ideas" package, and to strive to achieve the four teaching objectives also included. The teachers were given many activity ideas which they could use to teach the concepts and meet the objectives.

In order to test whether or not the teachers included nutritional concepts in their curricula, they were asked: 1) which of the nutritional concepts in the "Big Ideas" package they taught; and 2) which teaching objectives they were able to achieve, during the year in which they were first involved in the Nutrition at School program and in each year following. Table 5 presents the findings for the teachers of grades K to 3, and Table 6 shows the findings for the teachers of grades 4 to 6. The starred years (*) indicate the years when the teachers were first involved in the Nutrition at School program. The years immediately under each starred year, except 1979/80, are "the years following" for that same group of teachers as were first involved in the program in the starred year above.

Teachers were also asked to give reasons why they were unable to teach any one or more of the nutritional concepts, or unable to achieve any one or more of the teaching objectives, during the year they were involved in

Table 6
Percentage of all 4-6 Teachers Who Taught Concepts and Achieved Teaching Objectives
in the Year First Involved in the Nutrition at School Program and in the Years Following

Years First Involved in Program and Subsequent Years	Concepts and Teaching Objectives						
	Concept A (Balanced Diet) No. who taught concept	Concept B (Food Groups) No. who taught concept	Objective 1 (Identification) No. who achieved objective	Objective 2 (Classification) No. who achieved objective	Objective 3 (Function) No. who achieved objective	Objective 4 (Selection) No. who achieved objective	
Teachers first involved in program in 1976/77: n=13 *1976/77	11	11	8	8	6	8	
1977/78	7	8	5	6	3	5	
1978/79	6	6	3	6	4	6	
1979/80	6	6	3	4	4	5	
Teachers first involved in program in 1977/78: n=17 *1977/78	14	16	10	12	8	12	
1978/79	6	7	4	7	3	5	
1979/80	8	8	5	6	5	5	
Teachers first involved in program in 1978/79: n=26 *1978/79	21	22	15	22	18	19	
1979/80	10	10	3	6	5	7	
Teachers first involved in program in 1978/80: n=60 *1979/80	54	58	36	56	41	46	

* denotes year when teachers were first involved in the Nutrition at School Program. The years below are the years subsequent to the year of first involvement in the program.

the program or in any year following.

Findings for Teachers of Grades K to 3

For the teachers of grades K to 3, the percentage of teachers teaching nutritional concepts A and B in their first year of involvement in the program was high. The percentage of teachers who reported they taught Concept A in their first year of involvement ranged from 91.7% to 96.0%. Similarly, for Concept B the range was 88.9% to 92.0%. The same pattern was noted for the percentages of K to 3 teachers who achieved the teaching objectives in their first year of involvement, with the exception of Objective 4 (function). Although the percentage of teachers meeting this objective in their first year of involvement in the Nutrition at School program had been increasing, it was still much lower than for the other teaching objectives (ranging from a low of 62.5% for 1976/77 teachers to a high of 72.0% for 1978/79 teachers). Of the teachers who stated reasons for not achieving this objective, most felt Objective 4 was too complex for the students, while others stated they did not have enough class time or preparation time to meet the objective.

In years following the teachers' first year of involvement in the program, the percentage of K to 3 teachers who taught the nutritional concepts A and B decreased. The average decrease in the percentage of K to 3 teachers teaching Concept A was 17.5% and 14.9% for Concept B, for 1976/77 to 1978/79. Comments by some teachers indicated that they felt nutrition education should be (or is) included in the health curriculum and, therefore, should be taught by the health teacher. Teachers

appeared to have difficulty finding class time for including nutrition education in other subject areas. Lack of class time (the most often cited reason for not teaching Concept A), and the feeling that the concept was too complex for the students (the main reason given for not teaching Concept B) were major reasons stated by the teachers.

The percentage of teachers who achieved the teaching objectives in the years following the year of first involvement showed a comparable drop and leveling off after the second subsequent year. The average decrease in the number of teachers who did not meet the teaching objectives in the year following their first year of involvement in the program for each teaching objective was as follows: Objective 1, 19.9% decrease; Objective 2, 21.6% decrease; Objective 3, 20.8% decrease; and Objective 4, 18.7% decrease. The data indicated, in general, that 75% of the sampled teachers of Grades K to 3 were still teaching Concepts A and B four years after their first involvement in the program. However, the average drop in the number of teachers who failed to achieve a teaching objective in the year following their first year of involvement in the Nutrition at School program was twenty-percent.

Findings for Teachers of Grades 4 to 6

For the teachers of grades 4 to 6, the percentage of teachers who taught nutritional concepts A and B in their first year of involvement in the program was lower than for the K to 3 teachers, but was still considered by the researcher to be high. The percentage of teachers who taught Concept A ranged from 80.8% to 90%; while 84.6% to 96.7% of the

teachers taught Concept B.

The percentages of teachers who achieved the teaching objectives in their first year of involvement in the program was also in general lower than for the K to 3 teachers. Again, the teaching objective called "function," in this case Objective 3, had lower percentages of teachers achieving that objective. The percentage of teachers achieving Objective 3 showed an increase between 1976/77 and 1979/80, the greatest increase being between 1977/78 and 1978/79.

Of the teachers who stated reasons for not achieving Objective 3, lack of class time and the feeling that the objective was too complex for the students were most frequently stated. Lack of class time and/or preparation time was the main reason listed by teachers for not achieving the other teaching objectives as well.

In the years following the teachers' first year of involvement in the program, the percentage of 4 to 6 teachers who taught the nutritional concepts decreased sharply. The average drop after the first year of involvement was 40.2% for Concept A and 40.7% for Concept B. By the second year following, percentages appeared to stabilize between 35% and 47% of the teachers teaching the concepts.

The percentages of teachers who achieved the teaching objectives for grades 4 to 6 in the years following the year of first involvement in the program showed a sharp decrease as well. The average decrease in the percentage of teachers continuing to achieve the teaching objective

between first year of involvement in program (1976/77 to 1978/79) and first year following for each teaching objective was as follows: Objective 1, 35.5% decrease; Objective 2, 35.9% decrease; Objective 3, 34.8% decrease; and Objective 4, 37.5% decrease. Although the percentage of teachers achieving the teaching objective in the first year of involvement in the program had, in general, shown an increase since 1976/77 for Objectives 1 to 4, the percentage of these teachers who continued to meet the objective in the year following had decreased

In summary, the main findings of this section are:

1. The percentage of teachers who achieved the teaching objective "function" (Objective 4 for grades K to 3 and Objective 3 for grades 4 to 6) was much lower than for the other teaching objectives or the nutritional concepts both in the first year of involvement in the program, and in the years following.
2. The percentage of teachers teaching nutritional concepts and achieving objectives was lower for the grade 4 to 6 teachers than for the K to 3 teachers.
3. For the teachers of grades 4 to 6 the percentage of teachers who taught nutritional concepts and achieved objectives showed a decided drop in the years following the first year of involvement in the program.
4. Percentages of all 4 to 6 teachers who reported achieving the

teaching objectives each year increased for Objectives 2 and 4, decreased and leveled off for Objective 1, and decreased from 1976/77 to 1977/78, but made a large leap in 1978/79 before leveling off for Objective 3.

Findings Related to Teachers' Use of the Materials Provided at the Nutrition at School Teacher Workshop and Other Resources While the Nutrition at School Program was in the School and in Subsequent Years.

This section of the report presents findings related to issues 2, 4, and 5, identified by the Nutrition at School Core Committee:

2. If teachers included nutritional concepts in their curricula, which materials in the "Big Ideas in Nutrition Education" curriculum package were used and what other resources were used?
4. If, in subsequent years, teachers continue to include nutritional concepts in their curricula, which material in the "Big Ideas in Nutrition Education" were used and what other resources were used?
5. If yes to above, does the material become too repetitive as the students progress from one grade to the next?

Teachers who attended the Nutrition at School teacher workshop received resource materials, including the "Big Ideas in Nutrition Education" curriculum package, for use in teaching nutritional concepts in the classroom. In addition, they were given a resource list of other resources which they could order for use in their school.

Teachers who participated in this evaluation were asked what workshop

materials they used, and which other resources they used, during the school year in which they were first involved in the Nutrition at School program, and in the years following. Their responses are tabled in Appendix C. Table C-1 presents the findings for teachers of grades K to 3, and Table C-2 shows the findings for the 4 to 6 teachers, related to use of materials received at the Nutrition at School teacher workshop.

In general, use of materials received at the Nutrition at School teacher workshop followed a similar trend to teachers' involvement in teaching nutrition concepts. Use of the materials was high in the year the teacher was involved in the Nutrition at School program, but showed a pronounced decrease in the years following. There were no materials which showed an unusual pattern or trend in their use or which had very high or very low percentages of use.

These nutrition education materials were ranked in order of use by teachers in their first year of involvement in the program. The ranking, presented in Table 7, was obtained by averaging the percentage of teachers using the material in their first year of involvement across the four years 1976/77 to 1979/80. The materials were then ranked in order of highest average percentage of use to lowest.

Teachers of both grades K to 3 and 4 to 6 used the Big Ideas in Nutrition Education curriculum package the most. The packages were colorful, attractive, organized and easy to use. The "Food Models", and Canada Food Guide poster, and Study Prints were also ranked high. These materials were colourful, ready-to-use materials which the teachers

Table 7

Nutrition at School Teacher Workshop Materials
Ranked in Order of Teachers' Use of Materials in
Teaching Nutrition Education in Classroom¹

Materials for Teachers of Grades K to 3:	
1. <u>Big Ideas in Nutrition Education</u>	86.0
2. Food Models	79.6
3. Study Prints	72.9
4. Teacher Supplement	54.7
5. <u>Handy Nutrition</u>	50.4
6. <u>Good Eats for Children</u>	47.7
7. Canada Food Guide poster	40.2
Materials for Teachers of Grades 4 to 6:	
1. <u>Big Ideas in Nutrition Education</u>	80.8
2. Food Models	72.6
3. Canada Food Guide poster	72.0
4. <u>Handy Nutrition</u>	61.6
5. Bar Graphs	61.5
6. Teacher Supplement	59.3
7. <u>How Your Body Uses Food</u>	47.3
8. "Food Trek" poster	34.7

¹ Materials are ranked in order of highest average percentage of teachers using material from 1976/77 to 1979/80, to lowest.

could easily fit into their classroom lesson plans with little preparation.

Let's Talk About Food was eliminated from Table 7 since the questionnaire had asked teachers to indicate its use from 1976 onwards, but the material was in fact only made available in 1979-80. Of those teachers who were first involved in the program in 1979/80, however, very few indicated they had used this material. The Teachers Supplement ranked fourth for the K to 3 teachers and sixth for the 4 to 6 teachers. The booklet, Handy Nutrition, ranked fifth for the K to 3 teachers and fourth for the 4 to 6 teachers. Some teachers commented that the booklet was too "technical" to use in teaching, but was useful as a reference. The 4 to 6 teachers may have used the booklet more with older students. How Your Body Uses Food ranked low in use by the 4 to 6 teachers.

The teachers in this survey were asked for reasons why they did not use particular materials they received at the Nutrition at School teacher workshop. Of the teachers who responded to the question, most stated that some materials were not used due to lack of time, while others thought the materials were inappropriate for their grade. Other reasons given were: inappropriate for grade level, only one copy available in the library, and facilities, materials or time were required which were not available. Several teachers mentioned that it was difficult to recall whether they had used the material in past years or not.

An additional question posed by the Nutrition at School Core Committee was added to the study when the questionnaire was developed. This question related to the effectiveness of the teaching materials received by teachers at the teacher workshop in teaching nutritional concepts in their classroom. Table 8 shows these materials ranked in order of perceived effectiveness. A more detailed analysis is located in Appendix C, Table C-3. The ranking was obtained by adding the percentages of columns 4 and 5 for each material in Table C-3 to give the percentage of teachers who found each material "effective". The materials were then ranked from highest percentage of teachers stating the material was effective to lowest.

This scale may be interpreted only as a rough indicator of the effectiveness of the materials for teaching nutrition education, because the teachers did not have a specific measuring tool for determining how effective each material was, nor did they likely have the materials right in front of them as would have been possible with a personal interview format. However, because at least 50% of the teachers thought all the materials were effective (with the exception of the Handy Nutrition booklet by the teachers of grades K to 3 and the "Food Trek" poster for teachers of grades 4 to 6), this is an indication that all the materials did help the teachers in their teaching. None of the materials ranked low enough to warrant their future removal. The ranking of the materials in terms of their perceived effectiveness for teaching nutrition education is similar to the ranking of teachers' use of the materials.

Table 8

Nutrition at School Teacher Workshop
Materials Ranked in Order of Teachers' Perceived
Effectiveness of the Materials for
Teaching Nutrition Education

Nutrition Education Materials Received at Teacher Workshop	Percentage of Teachers who Ranked Material as Effective
Materials for Teachers of Grades K to 3:	
1. Food Models	89.4
2. <u>Big Ideas</u> Envelope	82.0
3. Study Prints	82.0
4. Teacher Supplement	75.4
5. Canada Food Guide poster	66.7
6. <u>Good Eats for Children</u>	52.4
7. <u>Handy Nutrition</u>	46.3
Materials for Teachers of Grades 4 to 6:	
1. <u>Big Ideas</u> Package	74.4
2. Bar Graphs	73.6
3. Food Models	72.7
4. Teacher Supplement	70.3
5. Canada Food Guide poster	70.1
6. <u>Handy Nutrition</u>	58.6
7. <u>How Your Body Uses Food</u>	58.3
8. "Food Trek" poster	48.9

Teachers participating in this evaluation were asked what other resources, in addition to materials received at the Nutrition at School teacher workshop, they used while they were involved in the Nutrition at School program and in the years following. Few specific titles of additional resources were supplied by the teachers. It may be that listing these resources demanded a greater investment of their time or that, since the resources provided in the Nutrition at School project were satisfactory, they did not seek additional resources. The most popular resource used by the teachers was films. Other important resources listed were written materials other than those received at the teacher workshop (titles were not specified), and guest speakers such as nutritionists, dental hygienists, nurses, and dietary students from S.A.I.T. Puppet shows and Mulligan Stew comics were also popular.

A concern expressed by members of the Nutrition at School Core Committee was whether or not teachers were experiencing difficulties in obtaining any of the additional resources available to them. These additional resources included those in a resource list given teachers at the Nutrition at School teacher workshop. Teachers were asked if they tried to obtain any of these additional resources, and what difficulties if any, they experienced. This question was left open-ended to encourage teachers to explain what problems they encountered in trying to obtain these resources. This resulted in many teachers neglecting to answer the question at all, possibly due to a lack of time. Several teachers also stated that they understood that it was up to the school or the Home Economist to obtain

materials, and thus, felt the question was not applicable to them. Eighty-two teachers responded to the question. Of those teachers who tried to obtain additional resources, 23 teachers or 28% said they experienced some difficulty. Fifty-nine teachers or 57.8% did not experience any difficulty. In general, teachers' comments related to difficulties in obtaining films. The system of ordering films presented difficulties as well as the problem of obtaining films exactly when they were needed. It appears that schools must book well in advance in order to obtain a film they wish to use and yet often cannot judge exactly when it will be required. Some schools may keep the film(s) longer than they should, thus, causing delays for other schools.

Because the nutrition education materials presented to the teachers at the Nutrition at School teacher workshop in the form of the Big Ideas in Nutrition Education materials covered more than one grade (i.e. grades K to 3, or 4 to 6), the issue was raised by the Nutrition at School Core Committee concerning representativeness of the material (Issue number 5 under "Focus of Evaluation"). It was felt that students would be exposed to repetition of the same material as they progressed from one grade to the next. Teachers were asked to comment on this issue and to make suggestions as to how they would avoid repetition for the students as they moved from one grade to the next. The teachers responded to the question with many comments and advice. Table 9 lists the suggestions teachers gave for avoiding repetition.

As Table 9 indicates, teachers do not seem to see the material in

Table 9
Teacher Suggestions for Avoiding Repetition
for Students When Using the "Big Ideas" Materials

Stated Difficulties	Number of Teachers	Adj.%
No need to worry about repetition-repetition reinforces learning	47	29.7
Expand concept from lower to higher grades	23	14.6
Teachers meet to plan which material is appropriate at each grade level	22	13.9
Each teacher chooses own ideas to suit grade level	17	10.8
Teachers check with teachers of lower grades and vary lessons accordingly	10	6.3
Use a different approach each year	9	5.7
Teachers coordinate program with textbooks and curriculum guides (health)	7	4.4
Should have a different learning package for each grade level	6	3.8
Should specifically state learning objectives for each grade and calibrate each concept according to the degree of difficulty	5	3.2
Let students' interest dictate how far to go with each concept	4	2.5
Use guest speakers, activities, games, songs, etc., for variety	3	1.9
Each teacher focuses on different concepts	2	1.4
Students' interests and ideas change from year to year, thus, they look at the material from a different perspective	1	0.6
Don't teach as much in the following year	1	0.6
For primary division use identification and classification and add when basics understood	1	0.6

the "Big Ideas" materials as presenting problems of repetition for students. Thirty percent of the teachers suggested repetition is good as it reinforces learning of the concepts. The teachers had various suggestions for handling similar material for different grades. In general, it was suggested that teachers meet and plan together what each teacher would emphasize. Each teacher usually emphasizes certain concepts, or chooses different ideas and activities to suit his or her particular grade level. Some teachers found that by coordinating their nutrition program with textbooks and curriculum guides for their grade level, repetition could be avoided. Other teachers varied their program each year by using different guest speakers and activities. Six teachers thought a separate learning package should be developed for each grade level which would specifically state learning objectives for each grade.

It did not appear, therefore, that there was sufficient evidence to state that repetition is a problem for teachers. In fact, many educators believe repetition reinforces learning. Teachers should be encouraged, however, to meet with other teachers to plan their nutrition education program and to check what was taught by teachers in the years before. Alberta Agriculture could provide teachers with new ideas and ready-made activities at intervals to motivate teachers to continue to teach nutrition education and to assist them in making nutrition education varied and interesting for their students, and with suggestions for adapting activities to suit different grade levels.

In summary, the main findings of this section are:

1. Use of materials received at the Nutrition at School teacher workshop was high in the year the teacher was involved in the program, but decreased in the years following.

2. Materials used most often were the Big Ideas in Nutrition Education packages and the attractive, ready-to-use materials such as the food models, study prints and Canada Food Guide poster. The main reason any materials were not used was lack of time.

3. Teachers' perception of the effectiveness of the materials for teaching nutrition followed a similar trend to their use (i.e. those materials used most often were thought to be most effective).

4. The most important resource used by teachers in addition to the materials received at the Nutrition at School teacher workshop was films.

5. The main difficulties experienced by teachers in obtaining additional resources related to obtaining films when needed by the school. The necessity to book films early before lesson plans were finalized, and delays in receiving films by the date ordered, were the main problems.

6. Repetition for students due to materials covering several grades did not present a problem for teachers. Meeting with other teachers to plan programs together eliminated many problems that could

be caused by repetition.

**Findings Related to Teachers' Attitudes About Teaching Nutrition
Education and to Follow-up to the Nutrition at School Program**

This section of the report presents findings related to issues, 6, 7 and 8, identified by the Nutrition at School Core Committee:

6. If follow up activities are taking place, what are they, and how effective are they in teaching nutrition?
7. What kind of resources could Alberta Agriculture provide which would motivate and support teachers to continue to include nutritional concepts in their curricula? In what subject areas should resources be provided?
8. If funding for special follow-up projects is provided by Alberta Agriculture, is more nutritional education included in the curricula than without funding?

This section also reports findings related to the other issues identified by the Nutrition at School Core Committee after the study was in progress:

10. How often do teachers feel children should be exposed to nutrition education in the school?
11. If the teacher continues to use the "Big Ideas in Nutrition Education" materials after the program ends in their school, for how long would the materials be adequate for the teacher to effectively teach nutrition education?
12. Given a list of possible types of "follow-up" to the Nutrition at School program, how useful

do teachers perceive each to be for teaching nutrition education in their classroom?

Teachers responding to this evaluation study were asked what activities took place in their school after the food sample program ended. They were not asked, however, to evaluate the effectiveness of these activities. Table 10 lists the teachers' responses. It appeared that the most popular activities that took place in the schools were special parties or food fairs with nutritious food and guest speakers during, or at the end of, the food sample program. It was surprising that some of the more obvious activities to implement good nutrition in schools, such as changing food in vending machines to more nutritious foods, or noon milk sales and snack shacks to sell nutritious foods, were used by so few schools. It was encouraging to note, however, that some teachers listed better lunches brought by students from home as an important outcome of the program. These findings indicated that a high percentage of the teachers were making some attempt to incorporate good nutrition into school activities, although the number of different activities that took place was not large. However, some of the activities, such as the snack shacks or vending machine changes, should have long lasting results.

A particularly beneficial activity which should have continuing positive results was the continuation of the snack program in the school by the parents and the school board (five schools). However, this may be costly and requires a great deal of organization to implement. If this is desirable as a follow-up, some suggestions for obtaining funding and organizing the snack program in the school could be suggested to teachers at the teacher workshop or in a newsletter.

Table 10

Follow-up Activities Engaged in by
Schools After Food Sample Program Ended

Activity	Number of Teachers	Adj.% ¹
Nutritious foods for class parties and school activities	204	87.6
Guest speakers on nutrition	31	13.3
Food Fairs	31	13.3
Snack shack	26	11.2
Changing food in vending machines	23	9.9
Better lunches from home by students	12	5.2
Continuation of snack program (by parents and school board)	5	2.1
Special meal to end program	4	1.7
International foods tasting party	3	1.3
Noon milk sales	1	.4
Field trip	1	.4
Halloween project	1	.4

¹The adjusted percentage shows what percentage of the total number of teachers who stated any activities, listed that activity as one which took place in their school. Many teachers listed more than one activity.

In looking at the question of what kind of resources Alberta Agriculture could provide to motivate teachers to continue to include nutritional concepts in their curricula, teachers were asked whether or not they preferred to receive their nutrition education materials "all at once," or to receive some during their involvement in the Nutrition at School program and some in a follow-up program. Most teachers stated they preferred to receive their materials "all at once", in order to get an overview of what they had to work with and to better plan their program. Of the Edmonton and rural Alberta samples, 82.5% stated they preferred to receive their materials "all at once". A lesser percentage, (69.2%), of the Calgary teachers responded in a similar way.

Teachers who checked the second category, "in a follow-up program," were asked what type of materials they would like to see provided as follow-up to the Nutrition at School program. Their suggestions lent support to previously made suggestions concerning the provision of additional, ready-to-use materials to motivate teachers to continue to include nutritional concepts in their curriculum. The teacher responses suggested that "follow-up" should consist of reminders to teachers to continue nutrition education in their classroom. These reminders could include easily usable materials such as posters, worksheets and other activities which encourage student involvement and which, either are planned for each separate grade level, or include suggestions for adapting to suit separate grade levels. The teachers' suggestions for follow-up are listed in Table C-4 in Appendix C.

Teachers who responded to this survey were also asked if the materials they received at the Nutrition at School teacher workshop were sufficient to enable them to continue to teach nutrition after the food sample program ended, and for how long. Most of the teachers (94.4% of the Edmonton and rural Alberta teachers and 94.9% of the Calgary teachers) felt the materials were sufficient to continue teaching nutrition education after the food sample program ended. However, they also stated that in general these materials were sufficient for no longer than two years following involvement in the program. New materials would be necessary two years after the food sample program ended in order that they could continue to teach nutrition education.

This study attempted to determine teachers' attitudes towards how often nutrition education should be offered in schools in order for the children to retain the information learned in the Nutrition at School program. Most of the teachers (58.6%) felt children should be exposed to nutrition education every year, while 21.5% of the teachers stated every month. Other teachers thought that every two years (16.1%) or every three years (3.8%) was sufficient. Since the majority of the teachers felt nutrition education should be taught at least every year, and most teachers stated the materials received at the Nutrition at School teacher workshop were sufficient to teach nutrition education for not longer than two years, additional materials are needed if teachers are to continue to teach nutrition education every year.

In order to determine what types of additional materials teachers would find most useful for teaching nutrition education, teachers were

asked to rate various types of materials in terms of how useful they would be for teaching nutrition in their classroom. Their responses were ranked in order of decreasing "usefulness" to form a picture of which types of materials teachers saw as most useful for teaching nutrition education (Table 11). The materials ranked as most useful by teachers were the same types of materials as those used most often. It is suggested that additional classroom activities could be supplied to all teachers who have been on the program. They could be provided in the form of ready-to-use activities or as a colourful newsletter of new ideas and information. Resource lists ranked fairly high suggesting teachers need a choice of resources in order to adapt the program to their individual student needs. Mini lectures ranked low, possibly due to a misunderstanding as to what they were, as indicated by comments from many of the teachers. Homework exercises ranked low also. Teacher comments stressed the fact that students already have little time for homework.

Teachers were asked to suggest other materials that they felt would be useful for teaching nutrition. The number of responses to this question were low. The most often made suggestion (by six teachers) was "tips on parent involvement or material to send home to parents to get them involved". Other suggestions included: games or exercises, worksheets, comics, posters, study prints, food models, suggestions for field trips, and a repetition of workshop for new teachers. These suggestions are similar to earlier responses concerning types of materials teachers wished to see provided in a follow-up program.

Table 11

Various Types of Materials Ranked in Order of
Teachers' Perceived Usefulness of the
Material for Teaching Nutrition

Material	Percentage of Teachers Perceiving Material as Useful
1. Additional classroom learning activities	81.3
2. Ideas for special projects	80.9
3. Nutrition information for teachers	74.6
4. Resource lists of other visual aides	68.4
5. Resource lists of other teaching materials	63.5
6. Mini lectures	34.9
7. Homework exercises	27.2

With regards to issue 8, concerning whether or not more nutrition education is included in the curricula when funding for special follow-up projects is provided by Alberta Agriculture than when funding is not provided, evidence available was not conclusive enough to say to what extent teachers continued to include nutritional concepts in their curricula without funding. However, because the percentage of teachers who continued to teach nutritional concepts decreased after the food sample program ended, it is likely that continuing support had a positive effect on teachers' participation in nutrition education. Any support funding could provide, whether it be a continuation of the food sample program, additional films, or written materials may motivate teachers to continue to incorporate nutritional concepts into their curricula more than if they had to provide these resources themselves.

In summary, the main findings of this section are:

1. A high percentage of the teachers had made some attempt to incorporate good nutrition in school activities after the food sample program ended in their school.
2. Most teachers preferred to receive nutrition education materials "all at once" rather than receiving some in a follow-up program.
3. Teachers wished to receive follow-up materials which included ready-to-use activities and which would act as reminders to motivate

them to continue to incorporate nutrition education into their teaching.

4. Most teachers stated the materials received at the Nutrition at School teacher workshop were sufficient to continue to teach nutrition after the food sample program ended, but only for up to two years following the first year they were involved in the program.

Findings Related to the Four Units Developed as Follow-up to the Nutrition at School Program

Four draft nutrition education units developed as "follow-up" to the Nutrition at School program were presented to a subsample of the teachers for review and evaluation. Each teacher in the subsample was given one unit for review and a separate questionnaire designed to examine issue number nine:

9. Are the follow-up units being developed by the follow-up committee useful to teachers teaching nutrition?

The criteria given to the teachers in order to make it as easy as possible to evaluate the units were: clarity of objective for unit, relation of objective for unit to concepts taught previously in the Nutrition at School program, specificity of objectives (how specific objectives were in stating in behavioral terms what the student would be able to do when activities were completed), grade levels unit was suitable for, how interesting suggested activities were for students, whether or not the materials in the unit reinforced teaching of

nutrition concepts, and ease of integration of the activities and objective into classroom lesson plans.

Given the analysis the teachers were allowed to make, the units appeared, in general, to be well received. Most teachers said they did not foresee any difficulties in fitting the objectives and activities of the units into their classroom lesson plans. Those who foresaw difficulties stated lack of class time was an important factor. Teachers who received the "Food and Culture" unit also noted "lack of time for teaching and for the preparation required by the activities."

Tables summarizing the results obtained from teachers regarding the follow-up units appear in Appendix D and show how teachers rated each unit in terms of clarity of objective, relation of objective to previously taught nutritional concepts, specificity of objective, and how the activities rated in terms of interest for students, reinforcement of nutritional concepts already learned, and ease of integration into classroom lesson plans (Tables D-1, D-3, D-5, D-7). Tables D-2, D-4, D-6 and D-8 show the grade levels teachers felt their unit was suitable for, and Tables D-9 to D-12 give teachers' attitudes to other types of possible follow-up materials in terms of their usefulness compared to the unit they were evaluating.

Looking at each unit individually, teachers rated the objective and activities of the Nutrition and Fitness unit fairly positively, with the exception of the specificity of the objective. This objective may

need to be stated in more behavioral terms which will tell the teacher exactly what the student will be able to do when he/she has completed the activities for the unit. Writing objectives in behavioral terms helps the instructor to select activities and to evaluate student performance. It appears teachers feel this unit is most appropriate for grades five and six although it could also be used for grade four.

For the follow-up unit, Food and Culture, the objectives were evaluated as being clear, but the relation of the objective to previously taught concepts and specificity were less favourably evaluated. These would need further attention in subsequent drafts. Activities were perceived by the sample as interesting, reinforcing and easily integrated. Teachers rated this unit as most suitable for grade four but it could also be used with grades three, five and six.

The Farming K to 3 unit was rated highly. Again, teachers felt that the objective may need more work to make it more specific and better related to previously taught nutritional concepts. Teachers found this unit most suitable for grade two, but it could also be used for grade one and three. Only 22.2% of the teachers felt the unit was suitable for kindergarten students.

Teachers' evaluation of the activities and objective in the unit, Farming 4 to 6, showed there does not appear to be any particular part of the unit which was rated low enough to indicate improvements. The unit was judged most suitable for grade five, although it is also

suitable for grades four and six.

Using the criteria given to evaluate them, the teachers judged these units to be adequate. However, there is no strong evidence that indicates these units are exactly what teachers want or need to continue to teach nutrition education. Teachers were asked to rate other possible types of follow-up materials as being more or less useful than the unit they were given to evaluate. The data indicated that there is a trend towards teachers perceiving additional classroom learning activities, ideas for other special projects, nutrition information for teachers, and resource lists of other visual aids as somewhat more useful than these units, while homework exercises, mini lectures and resource lists of other teaching materials were perceived as less useful.

Given the time constraints imposed on teachers at the time data was collected, the teachers' assessment of these units was only superficial. A more in-depth analysis would have necessitated pre-testing in the classroom as well as opportunity for suggestions in particular sections.

In summary, it would appear that:

- 1) In general, the units were favourably assessed by the teachers. Lack of class time and time for preparation of the activities were the only difficulties the teachers foresaw in fitting the objectives and activities of the

units into their classroom lesson plans. 1

- 2) The objective in each of the units, Nutrition and Fitness, Food and Culture and Farming K to 3 were rated less favourably in terms of relation of the objective to previously taught concepts, and specificity of the objective.
- 3) In general, the units, with the exception of Farming K to 3, were judged as most appropriate for grades 4 to 6. Farming K to 3 was rated low in suitability for kindergarten students.

SUMMARY OF MAJOR FINDINGS AND IMPLICATIONS FOR THE NUTRITION AT SCHOOL PROGRAM

In interpreting the findings of this study, it should be noted that the teaching environment is made up of many elements. These elements, described in Chapter 3, affect which nutritional concepts are taught in the classroom and which teaching objectives are met, how much time is devoted to nutrition education, which nutrition resource materials are used, what special nutrition related activities take place in the school, and what is done in terms of follow-up to the Nutrition at School program. This evaluation attempts to provide an understanding of teachers' involvement and perceptions of selected aspects of the Nutrition at School program. It is, therefore, only a partial analysis of the teaching environment and its impact on one particular extra-curricular program.

Findings of the Evaluation

The following constitutes the major findings of this study associated with the questions posed in the research design:

1. The percentage of teachers who achieved the teaching objective "function" (Objective 4 for grades K to 3 and Objective 3 for grades 4 to 6) was much lower than for the other teaching objectives or the nutritional concepts both in the first year of

involvement in the program, and in the years following.

2. The percentage of teachers who taught nutritional concepts and achieved objectives was lower for teachers of grades 4 to 6 than for the K to 3 teachers.

3. The percentage of teachers who taught nutritional concepts and achieved teaching objectives in grades 4 to 6 showed a decided drop in the years following the first year of involvement in the program.

4. Percentages of all 4 to 6 teachers who reported achieving the teaching objectives each year increased for Objectives 2 and 4, decreased and leveled off for Objective 1, and decreased from 1976/77 to 1977/78, but made a large leap in 1978/79 before leveling off for Objective 3.

5. Use of materials received at the Nutrition at School teacher workshop was high in the year the teacher was involved in the program, but decreased in the years following.

6. Materials used most often were the Big Ideas in Nutrition Education packages and the attractive, ready-to-use materials such as the food models, study prints and Canada Food Guide poster. (The main reason any materials were not used was lack of time.)

7. Teachers' perception of the effectiveness of the materials

for teaching nutrition followed a similar trend as usage patterns in that those materials used most often were thought to be most effective.

8. The resource used most by teachers in addition to the materials received at the Nutrition at School teacher workshop was films.

9. The main difficulties experienced by teachers in obtaining additional resources related to obtaining films when needed by the school. The necessity to book films early before lesson plans were finalized, and delays in receiving films by the date ordered, were the main problems.

10. Repetition for students due to materials covering several grades did not present a problem for teachers. Meeting with other teachers to plan programs together eliminated many problems that could be caused by repetition.

11. A high percentage of the teachers had made some attempt to incorporate good nutrition in school activities after the food sample program ended in their school.

12. Most teachers preferred to receive nutrition education materials "all at once" rather than receiving some in a follow-up program.

13. Teachers wished to receive follow-up materials which included ready-to-use activities and which would act as reminders to motivate them to continue to incorporate nutrition education into their teaching.

14. Most teachers stated the materials received at the Nutrition at School teacher workshop were sufficient to continue to teach nutrition after the food sample program ended, but only for up to two years following the first year they were involved in the program.

15. The four follow-up units developed by the Nutrition at School Core Committee were well received by the teachers. The teachers rated the units fairly high on the criteria given, but also felt that some other types of materials would be more useful to them. These other types of materials were: additional classroom learning activities, ideas for other special projects, nutrition information for teachers, and resource lists of other visual aids.

Implications for the Nutrition at School Program

Several patterns emerged from the descriptive analysis of the data which should have influence on subsequent offerings of the Nutrition at School program. Teachers were in general supportive of the program and the efforts of Alberta Agriculture in providing the resources and leadership for the program. Many expressed hopes that the program would return to their school soon.

The workshop and food sample program operated as motivators to teachers to become actively involved in the program. The drop-off in involvement in subsequent years illustrates the difficulty of maintaining an extra-curricular program on a continuous basis, at least without continued infusion of new material, leadership or other motivational devices.

Because of the decrease in the percentage of teachers who teach nutritional concepts and achieve the teaching objectives in the years following the year they are involved in the Nutrition at School program, it can be suggested that, firstly, emphasis be placed, at the teacher workshop, on the range of possibilities for student involvement activities. Teachers' attention should be drawn to the additional activities suggested in the Teacher Supplements, and in the other resources available which could be used for variety in following years.

Secondly, a newsletter from Alberta Agriculture could be sent periodically (at least twice a year) to all teachers who have been involved in the Nutrition at School program. This newsletter would serve as a reminder to the teachers to include nutritional concepts in their lesson plans. It might include nutrition facts, a question-answer column, new ideas for activities with suggestions for adapting them to each grade level, and, if possible, a "ready-to-use" student activity.

Use of materials appeared to be based upon practical

considerations such as: appeal, ease of use, and appropriateness to grade level. From the findings related to teachers' use of materials provided at the teacher workshop and other resources, it appears that use of materials follows a similar trend to involvement in teaching nutritional concepts. The teachers used the materials in the first year they were involved in the program, but less in the years following.

The materials used the most by the teachers, and which were rated the most effective, were the attractive, colourful, ready-to-use materials such as the "Big Ideas in Nutrition Education" packages, the Canada Food Guide poster, the Food Models and the Study Prints. The other materials provided contain many good ideas and activities which could be used by the teachers in the years following for variety if they are not all used in the first year on the program. Some of the materials could be examined to see how they could be made more attractive and better organized. For example, although an excellent source of ideas, the lack of organization in Let's Talk About Food may have caused teachers to find this material too confusing and difficult to use. The booklet, How Your Body Uses Food, appeared unattractive and dated. One with more recent illustrations may be used more often. Another material which contained many good ideas, but which ranked lower in use, was the Teachers' Supplement. Teachers' attention may need to be drawn to the activities and other information available in this and the other materials. More emphasis could be placed at the teacher workshops on providing the teachers with suggestions on how to incorporate these activities into their

curriculum. Special attention should be drawn to the suggested activities for achieving the "function" objective. It might also be that too many resources were provided to the teachers. One excellent resource with a well organized selection of activities might have been used more than many different resources which had to be perused many times to select appropriate activities.

Because most teachers felt that nutrition education should be taught at least every year, and that the materials provided at the Nutrition at School teacher workshop were only adequate to teach nutrition education for up to two years, new materials should be provided to the teachers to motivate them to continue to teach nutritional concepts and to provide new ideas and activities with which to work. Based on teachers' responses, these follow-up materials should be easy-to-use, require little preparation on the part of the teacher, contain suggestions for adapting to different grade levels, and preferably, include ready-to-use activities for the students. The follow-up units which were evaluated by the teachers provided many such activity ideas and suggestions. Although the teachers rated the units as satisfactory on the basis of the criteria given, they also noted that other types of materials would be more useful to them in teaching about nutrition. Perhaps this contradictory finding indicates that further exploration of teachers' needs be conducted before either continuing unit development or beginning development of alternate materials. Because a five category Likert scale was used and tests of statistical significance were not desired by the program decision-makers, difficulty was encountered in

analyzing the data to produce information upon which firm decisions could be based. The small cell size per unit and the large number who selected the middle (undecided) category made selection of any clear cut criteria for decision-making impossible. Only general trends could be concluded from the data, but consideration of only the two extreme categories might have led to biased interpretations, especially where the middle group was large. It is recommended that future evaluations of nutrition education resource materials allow time for more indepth examination of the resources and alternatives and for more detailed analysis of the data.

The teacher in the elementary school operates under severe time pressures with respect to teaching all the subjects which are necessary and preparing the teaching materials. These time constraints were the most frequently mentioned impediment to teaching concepts and attaining objectives. Because time limitations in the elementary curriculum do not support an "incidental" approach to the teaching of nutrition, a regular place is preferable so that all students receive such instruction. This may mean greater work with curriculum development in Alberta Education. In addition, stress might be placed, when developing or revising materials, on making them immediately usable (i.e. requiring little preparation time on the part of the teacher).

Time constraints have influenced teachers use of other resources as well. Films were the most popular, especially "Mulligan Stew", probably due to the little preparation required by the teacher.

Obtaining the films presented problems to some schools, however, indicating that the system of distribution be examined to see how problem areas such as availability to the schools when needed can be improved. The popularity of films for teaching nutrition education is further support for the findings of: Manoff (1973); Williams, Aleong, Merrow, and Morse (1980); Shapiro, Bale, Sardino, and Cerva (1974); and Jenkins, Stumo and Voichick (1975).

Since the materials on which the Nutrition at School program is based covered several grades, teachers might be encouraged to meet occasionally to plan the program together each year. In addition, the teachers might share ideas similar to Sodowsky's (1973) for incorporating nutrition education into several subject areas. If meetings are undesirable some contact might be made to see what concepts are being covered within the school and which activities are selected each year in order to make the program as varied and interesting as possible for the students.

An examination of the follow-up activities taking place in the schools indicated a high percentage of the teachers made some attempt to incorporate good nutrition into school activities. However, it appeared that enthusiasm fell after the first year. Ways of combining special school activities with nutrition education while the school is on the program and in following years could be suggested at the teacher workshop or in newsletters to the teachers as a way of maintaining the interest of both the teachers and the students in the program.

The level of difficulty of the objectives has an influence on whether or not they are taught and if the teacher perceives they have been attained. From the findings related to teachers' involvement in teaching nutritional concepts it appeared that teaching objective 4 (function) for K to 3 teachers and teaching objective 3 (function) for 4 to 6 teachers were more difficult for teachers to achieve. Several suggestions may be made for this finding. Close scrutiny of these objectives indicates that the objectives are at a higher cognitive level of understanding and that the suggested activities for achieving the objectives involve greater preparation on the teacher's part for implementation.

Teaching objective 4 for K to 3 teachers may have been more difficult for teachers to achieve because the suggested activities for achieving the objective do not have as much involvement for students and are very time consuming. This supports Baker's finding (1972) that learning experiences involving active participation helped children attain stated objectives. It is possible that teachers need a number of activities to choose from which have various levels of preparation time and student involvement.

Grade 4 to 6 teachers may have been experiencing difficulty achieving objective 3 due to lack of class time and because this objective is also at a higher level of understanding than the other objectives. One must view these findings within the context of the entire school curriculum. It may be that in grades 4 to 6 demands are heavier to teach more subjects, thus, allocating extra time for

nutrition education is difficult to accomplish within the tight schedule. The importance of providing ready-made activities which are not time consuming is obvious, especially for achievement of the "function" objective.

There is sufficient evidence in this study to conclude that the "function" objective at both levels is one which demands special attention in future work. While many options are open to the Nutrition at School program such as: dropping the objective, adapting it, or revising the approach; the decision must be based on the importance of the objective and how it fits into the total program. If it is sufficiently important to teach, every effort should be made to develop creative, educationally sound activities that fit into the demands of the school curriculum as it operates. The frequent mention of time constraints indicates that one must be fully familiar with the school curriculum in order to implement a special program such as Nutrition at School.

Two possible suggestions for attention to these objectives can be made. First, more, emphasis be placed on the development of a range of activities which have different levels of student involvement, but do not require much class time, and which are "ready-made", requiring little preparation time. These should be developed in cooperation with teachers who can provide feedback on their appropriateness to various grade levels and to time constraints. Access to a variety of activities is especially important to maintain enthusiasm in nutrition education after the food sample program ends.

Second, greater stress be placed on student activities at the Nutrition at School teacher workshop. Particular emphasis should be placed on the teaching objective "function" for both K to 3 and 4 to 6 teachers. Teachers should be made aware that the objective is on a higher level of cognitive understanding than the other objectives and that there are many activities available for achieving this objective.

Limitations of the Evaluation

Few evaluations are completed without experiencing situations which are problematic. In this evaluation two major limitations influence the application of the findings: the retrospective nature of this data covering a four year period and the timing of the collection of the data. The quality and reliability of future reports on frequency of teaching specific objectives and attaining them would be increased by subsequent program planning designs which incorporate an evaluation component each year. The suggestion was made in the conceptual framework that evaluation is part of the program planning process. It is evident that greater attention to this would save time in the long run and allow for a more solid base of information for decision-making.

Due to unforeseen difficulties that necessitated collecting data in Edmonton and rural schools during the last week of school and due to a school strike in Calgary, teachers were asked to complete this evaluation at very stressful times. This is another factor which may have influenced the attention which teachers gave to answering the

questions in more than a cursory manner. The frequent mention of time pressures indicate that evaluators should be more sensitive to selecting a data collection time frame that is conducive to careful attention to the task. While one cannot be assured of such attention, subsequent studies would be strengthened.

The technique used to assess the units may not have given teachers an adequate opportunity to assess the units based upon explicit criteria. The large numbers of teachers who were undecided about various aspects may indicate that the task of rating and comparing this material with other hypothetical materials was difficult. A focused interview with several teachers who had been allowed to study the unit might have revealed more information so that decisions about the development of additional resource materials could be made.

It should be noted here that, prior to the study, information about when each of the nutrition education resource materials became available to the teachers was not known. Some teachers responded to certain parts of the questions even though the material was not available at the time. This leads one to speculate that, due to the amount of information requested and the limited time available to the teachers to carefully think through each question, as well as the retrospective aspect, more accuracy in responses would be desirable. An interview format where teachers are shown the materials might be utilized in future evaluations and may give more accurate information about particular aspects of the material.

The present study has another limitation which should be considered when interpreting the data. While the sampling unit was teachers involved in the Nutrition at School program, in some cases the teacher who responded to the survey had not attended the workshop. This teacher may have replaced another who resigned or was on leave. These situations, however, are part of the real teaching situation in the school. In future programming, it might be useful to look at this group separately to determine whether or not they have special needs or problems. In addition, further research could examine those teachers who may have been involved in the program, but who have not continued to teach nutritional concepts and/or who did not attend the teacher workshop. The time constraints within the school setting, and the view that a particular subject matter area, health, has responsibility in doing the major work in nutrition education needs exploration.

Conclusion

An evaluation of this type is only one input to the total program planning process. Some suggestions for possible courses of action which were indicated by the data in the study have been made. The findings and possible implications presented in this study must, however, be further interpreted by those most closely involved in the program planning process. This study can only provide input to decisions which must also involve consideration of priorities for program development and implementation within the department, available budget allocations, available personnel resources, and any

other limitations involved in the operation of the Nutrition at School program.

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Appendix A
Questionnaires



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FACULTY OF HOME ECONOMICS

THE UNIVERSITY OF ALBERTA • EDMONTON, CANADA • T6G 2M8

May 26, 1980

TO TEACHERS SELECTED FOR THE NUTRITION AT SCHOOL EVALUATION STUDY

Dear Teacher:

This year Alberta Agriculture has commissioned the Faculty of Home Economics, University of Alberta, to conduct an evaluation of the Nutrition at School program. To do this, we are soliciting feedback about the program from a small randomly selected group of teachers throughout Alberta. As one of this group, your feedback about the program would prove invaluable in making decisions relative to (a) planning follow-up in schools that have previously participated in the program and (b) selecting and developing teacher resource materials.

All responses will be treated confidentially. The data will be compiled during July and August and reported for the province as a whole. No single person or school will be identified.

We would like to stress the importance of answering all the questions even though you may have not been involved in the Nutrition at School program for a few years.

We would appreciate it if you would find the time to complete this questionnaire in the next few days. We realize that in the month of June, you are busy with year-end activities, and therefore we have designed the questionnaire to elicit feedback on only the most essential facets of the program. With this approach, we hope that you will find it possible to respond quickly and with sufficient detail to guide our decisions.

A prompt response from you would be most appreciated and would assist us in meeting some tight time lines. Your cooperation in this study will be invaluable - your input will play an important part in decisions relative to the Nutrition at School program.

Please return the completed questionnaire in the enclosed self-addressed, stamped envelope by June 27, 1980.

If you should have any questions about the questionnaire itself, or the study in general, please feel free to contact us by phoning 432-5770.

Dr. Dianne K. Kieren
Research Project Director

Barbara McEwen
Researcher

1.

The questionnaire consists of four parts. In addition, some teachers will receive a fifth part in which they will be asked to evaluate some draft written resource materials.

Part One

1. As a teacher, in which school year(s) were you involved in the Nutrition at School program? Please check the year(s) that you were involved:

1973/74	_____	1977/78	_____
1974/75	_____	1978/79	_____
1975/76	_____	1979/80	_____
1976/77	_____		

2. Did you attend Nutrition at School teacher workshop(s)?

Yes _____ No _____

If yes, please state in which year(s) _____

3. What grade or grades did you teach in each of the following years?

(Note: Fill in only those years applicable to you.)

1976/77	_____
1977/78	_____
1978/79	_____
1979/80	_____

4. What grades are taught in your school? _____

5. Approximately how many students attend your school? _____

6. Where is your school located? Check one:

Calgary _____

Edmonton _____

Other (Please specify) _____

2.

PART TWO (A)

FILL IN IF YOU ARE A TEACHER OF GRADES K TO 3. IF YOU TEACH GRADES 4 TO 6 GO ON TO PART TWO (B) ON PAGE 5.

While you were involved in the Nutrition at School program you were introduced to nutritional concepts and teaching objectives in the "Big Ideas in Nutrition Education" curriculum package.

We realize it is not always possible to teach all the concepts or attain all the teaching objectives set up in the units. The reasons for this may be varied.

We are interested, however, in finding out what nutritional concepts you taught and what teaching objectives you met in your classroom. If you did not teach some concepts, or did not feel that certain objectives were met, we would appreciate knowing why this is so in order to realistically plan future materials.

I. For each CONCEPT listed below:

1. Circle the year you were first involved in the Nutrition at School program.
2. Check each year in which you taught the concept.
3. If you did not teach the concept check all those reasons why you did not.

CONCEPTS for Teachers of Grades K to 3:	Years				Reasons for not teaching CONCEPT (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
A. A balanced daily diet includes foods selected from each of the four food groups.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource material not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

3.

CONCEPTS for Teachers of Grades K to 3:	Years				Reasons for not teaching CONCEPT (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
B. Foods from the four food groups supply the nutrients needed for growth, health and energy.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

II. For each TEACHING OBJECTIVE listed below:

1. Circle the year you were first involved in the Nutrition at School program.
2. Check each year in which you feel you met the teaching objective.
3. If you did not meet the objective check all those reasons why you did not.

TEACHING OBJECTIVES for Teachers of Grades K to 3:	Years				Reasons for not meeting objective (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
1. Identification - The student will be able to name and enjoy a variety of foods from the four food groups.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource materials too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

4.

TEACHING OBJECTIVES for Teachers of Grades K to 3:	Years				Reasons for not meeting objectives (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
2. Classification - The student will be able to classify foods into the four food groups.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____
3. Selection - The student will be able to choose nutritious snacks and well-balanced meals from the four food groups.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____
4. Function - The student will explain the importance of foods from the four food groups for growth, health and energy.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

5.

PART TWO (B) FILL IN IF YOU ARE A TEACHER OF GRADES 4 to 6. IF YOU TEACH GRADES K TO 3 GO ON TO PART THREE (A) ON PAGE 8.

While you were involved in the Nutrition at School program you were introduced to nutritional concepts and teaching objectives in the "Big Ideas in Nutrition Education" curriculum package.

We realize it is not always possible to teach all the concepts or attain all the teaching objectives set up in the units. The reasons for this may be varied.

We are interested, however, in finding out what nutritional concepts you taught and what teaching objectives you met in your classroom. If you did not teach some concepts, or did not feel that certain objectives were met, we would appreciate knowing why this is so in order to realistically plan future materials.

I. For each CONCEPT listed below:

1. Circle the year you were first involved in the Nutrition at School program.
2. Check each year in which you taught the concept.
3. If you did not teach the concept check all those reasons why you did not.

<u>CONCEPTS</u> for Teachers of Grades 4 to 6:	<u>Years</u>				Reasons for not teaching concept (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
A. A wide variety of nutrients is essential for growth, health and energy.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

6.

CONCEPTS for Teachers of Grades 4 to 6:	Years				Reasons for not teaching concept (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
B. A combination of foods from the four food groups provides the necessary nutrients to perform these functions	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

II. For each TEACHING OBJECTIVE listed below:

1. Circle the year you were first involved in the Nutrition at School program.
2. Check each year in which you feel you met the teaching objective.
3. If you did not meet the objective check all those reasons why you did not.

TEACHING OBJECTIVES for Teachers of Grades 4 to 6:	Years				Reasons for not meeting objective (Check all those that apply)
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980	
1. Identification - The student will discover by experiment, that different foods contain different nutrients.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

7.

TEACHING OBJECTIVES for Teachers of Grades 4 to 6:	Years 1976/ 1977/ 1978/ 1979/ 1977 1978 1979 1980				Reasons for not meeting objective (Check all those that apply)
2. Classification - The student will classify foods into the four food groups on the basis of nutrient content.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource material not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____
3. Function - The student will identify the functions of the leader nutrients in each of the four food groups in terms of growth, health and energy.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____
4. Selection - The student will choose nutritious snacks and well-balanced meals from the four food groups.	—	—	—	—	☐ not enough class time ☐ not enough preparation time ☐ concept too complex for students ☐ resource material too complex for students ☐ resource materials not appropriate for integration into lesson plans ☐ other (specify) _____ _____ _____

PART THREE (A)

FILL IN IF YOU ARE A TEACHER OF GRADES K TO 3. IF YOU ARE A TEACHER OF GRADES 4 TO 6 GO ON TO PART THREE (B) ON PAGE 9.

In this part of the questionnaire we wish to find out what resources you used to teach nutrition education in your classroom.

1. The following is a list of nutrition education resource materials you received at the Nutrition at School teacher workshop.

For each material listed:

1. Circle the year in which you were first involved in the Nutrition at School program.
2. Check off all the years in which you used that resource material.
3. Circle the number in the right hand column corresponding to how effective that resource material was for you in teaching nutritional concepts for your classroom.

<u>Materials for Teachers of Grades K to 3:</u>	<u>Years</u>					<u>Effectiveness for teaching nutritional concepts</u>				
	1976/ 1977	1977/ 1978	1978/ 1979	1979/ 1980		VERY EFFECTIVE			NOT EFFECTIVE	
<u>"Big Ideas in Nutrition Education" envelope</u>	—	—	—	—		5	4	3	2	1
Study Prints (Photographs with classroom discussions on back)	—	—	—	—		5	4	3	2	1
Food Models (small individual food photographs)	—	—	—	—		5	4	3	2	1
<u>Handy Nutrition booklet</u>	—	—	—	—		5	4	3	2	1
Canada Food Guide poster	—	—	—	—		5	4	3	2	1
<u>Let's Talk about Food</u> (from Alberta Agriculture)	—	—	—	—		5	4	3	2	1
<u>Good Eats for Children</u> (recipes)	—	—	—	—		5	4	3	2	1
Teachers Supplement (mimeographed materials from Alberta Agriculture)	—	—	—	—		5	4	3	2	1

9.

PART THREE (B)

FILL IN IF YOU ARE A TEACHER OF GRADES 4 TO 6. IF YOU ARE A
TEACHER OF GRADES K TO 3 GO ON TO PART THREE (C) ON PAGE 10.

In this part of the questionnaire we wish to find out what resources you used to teach nutrition education in your classroom.

1. The following is a list of nutrition education resource materials you received at the Nutrition at School workshop.

For each material listed:

1. Circle the year in which you were first involved in the Nutrition at School program.
2. Check off all the years in which you used that resource material.
3. Circle the number in the right hand column corresponding to how effective that resource material was for you in teaching nutritional concepts in your classroom.

Materials for Teachers of Grades 4 to 6:	1976/ 1977/ 1978/ 1979/ 1987 1978 1979 1980				Effectiveness for teaching nutritional concepts				
					VERY EFFECTIVE			NOT EFFECTIVE	
"Big Ideas in Nutrition Education" envelope	—	—	—	—	5	4	3	2	1
Bar Graphs	—	—	—	—	5	4	3	2	1
Food Models (small individual food photo- graphs)	—	—	—	—	5	4	3	2	1
Handy Nutrition booklet	—	—	—	—	5	4	3	2	1
How Your Body Uses Food	—	—	—	—	5	4	3	2	1
Food Trek (digestive system poster)	—	—	—	—	5	4	3	2	1
Canada Food Guide poster	—	—	—	—	5	4	3	2	1
Let's Talk About Food	—	—	—	—	5	4	3	2	1
Teacher's Supplement (mimeographed materials from Alberta Agricul- ture)	—	—	—	—	5	4	3	2	1

10.

PART THREE (C) **FOR ALL TEACHERS TO FILL IN.**

1. Were there any materials provided at the Nutrition at School teacher workshop which you did not use at all?

Yes _____ No _____

If yes, why did you not use them?

Didn't think were appropriate _____

Didn't have time to use _____

Didn't get enough exposure on how to use _____

Other (please specify) _____

2. Should all the materials for the Nutrition at School program be provided all at once, or should some additional materials be provided in a follow-up program?

Check one: All at once _____ In a follow-up program _____

If you checked "in a follow-up program", what materials would you like to see provided? _____

3. At the Nutrition at School teacher workshop you received a list of resources you could use in addition to the "Big Ideas" materials (ie. films, books, guest speakers, slides, printed materials).

a) Which of these or other resources did you use while your school was on the Nutrition at School program? Please specify titles and put a check mark beside the ones you found especially useful to you: _____

11.

3. (b) If you were involved in the Nutrition at School program before 1979/80 which of these other resources referred to in part (a) did you use in the years following the year you were involved in the Nutrition at School program? Please specify titles and put a check mark beside those you found especially useful: _____

4. If you used any of the additional resources available, did you or your school experience any difficulties in obtaining them? Yes _____ No _____
If yes, please specify _____

5. The material in the "Big Ideas in Nutrition Education" packages covers several grades. Could you tell us what you do to avoid repetition for the student as he/she moves from one grade to the next? _____

12.

PART FOUR

In this part of the questionnaire, we would like your ideas and suggestions concerning a follow-up to the Nutrition at School program.

1. In order for the children to retain the information learned in the Nutrition at School program how often do you feel they need to be exposed to nutrition education in the school?

Every month _____

Every year _____

Every two years _____

Every three years _____

2. When your school was on the Nutrition at School program you received some materials such as the "Big Ideas in Nutrition Education" package. Do you think these materials were sufficient to enable you to continue to teach nutrition education after the food sample program ends?

Yes _____ No _____

If yes, for how long?

Remainder of school year _____

The year following _____

For two years following _____

13.

3. Please indicate how useful you feel the following types of materials would be for teaching nutrition in your classroom. For each type of material listed below, circle the number which indicates how useful that type of material would be for you.

	VERY USEFUL				NOT USEFUL AT ALL
<u>Resource lists</u> of other visual aids and where to get them	5	4	3	2	1
<u>Resource lists</u> of other resource teaching materials	5	4	3	2	1
<u>Written materials:</u>					
Ideas for special projects	5	4	3	2	1
Additional classroom learning activities	5	4	3	2	1
Nutrition information for teaching	5	4	3	2	1
Mini lectures	5	4	3	2	1
Homework exercises	5	4	3	2	1
<u>Others</u> (please specify) _____					

4. Check those activities (if any) related to nutrition which took place in your school after the Nutrition at School program ended.

Snack Shack _____

Guest speakers on nutrition _____

Changing food in vending machines to more nutritious foods _____

Food fairs _____

Nutritious foods for class parties _____

Nutritious foods for school activities (parent's night, etc.) _____

Other (please specify) _____

No activities took place in my school _____

Thank you again for taking the time to fill in this questionnaire. Your input is greatly appreciated!

PART FIVE

The following nutrition education unit is a sample prepared by Alberta Agriculture for follow-up to the Nutrition at School program.

You have been randomly selected to review and provide feedback on these proposed new print materials which are now at the "draft" stage. To date four "draft" units have been prepared for the purpose of conducting further research:

Nutrition and Fitness for grades 4 - 6

Food and Culture " " 4 - 6

Farming " " K - 3

Farming " " 4 - 6

You have received one of the units to respond to. Please be candid with your comments for this unit.

Please note that these are proposed drafts only and cannot be duplicated without permission from Alberta Agriculture.

1. On page two of your unit, Farming Grades 4 - 6, the stated objective is:

"To provide experiences that will increase the student's information about food: where it comes from; how we get it; the different forms in which foods are available. To increase the student's acceptance of foods."

Evaluate this objective on each of the criteria listed below. For each of the criteria circle the number which corresponds to your evaluation.

- | | |
|---|---|
| a) clarity | clear 5 4 3 2 1 unclear |
| b) related to concepts taught previously in the Nutrition at School program. | related 5 4 3 2 1 unrelated |
| c) tells what the student will be able to do when he/she has completed the activities in the follow-up unit | behavioral 5 4 3 2 1 non-behavioral |

2948

2. Circle the grade levels which you see the student activities in this unit as being most suitable for.

K	1	2	3	4	5	6
---	---	---	---	---	---	---

3. Circle the number below which corresponds to how interesting in general you think the suggested activities would be for students.

Interesting					Boring
5	4	3	2	1	

4. Circle the number below which corresponds to how much you think the materials in this unit reinforce learning of the nutrition concepts taught while your school was on the Nutrition at School program.

Reinforce learning of nutrition concepts		Don't reinforce learning of nutrition concepts
5 4 3		2 1

5. Circle the number below corresponding to how easily you could fit the activities and objective suggested in this unit into your classroom lesson plans.

Easily integrated into classroom lessons					Difficult to integrate into classroom lessons
5	4	3	2	1	

6. What difficulties, if any, would you have fitting these objectives and activities into your classroom lesson plans? _____

5(3)

7. Consider each of the following additional and/or other possible ways Alberta Agriculture might provide follow-up to the Nutrition at School program. We would like to know how more or less useful you would find these alternatives in comparison to the unit you have just reviewed.

Circle the number on the right corresponding to your answer to each of the following questions.

	MORE USEFUL			LESS USEFUL	
a) How useful would you find <u>resource lists of other visual aids</u> in comparison to the draft unit you just reviewed?	5	4	3	2	1
b) How useful would you find <u>resource lists of other teaching materials</u> in comparison to the unit you have just reviewed?	5	4	3	2	1
c) How useful would you find <u>ideas for other special projects</u> in comparison to the unit you just reviewed?	5	4	3	2	1
d) How useful would you find <u>additional classroom learning activities</u> in comparison to the unit you just reviewed?	5	4	3	2	1
e) How useful would you find <u>nutrition information for teachers</u> in comparison to the unit you just reviewed?	5	4	3	2	1
f) How useful would you find <u>mini lectures</u> in comparison to the unit you have just reviewed?	5	4	3	2	1
g) How useful would you find <u>homework exercises</u> in comparison to the unit you have just reviewed?	5	4	3	2	1

Thank you for taking the time to review this unit and answer this questionnaire.

>(1)

PART FIVE

The following nutrition education unit is a sample prepared by Alberta Agriculture for follow-up to the Nutrition at School program.

You have been randomly selected to review and provide feedback on these proposed new print materials which are now at the "draft" stage. To date four "draft" units have been prepared for the purpose of conducting further research:

Nutrition and Fitness for grades 4 - 6			
Food and Culture	"	"	4 - 6
Farming	"	"	K - 3
Farming	"	"	4 - 6

You have received one of the units to respond to. Please be candid with your comments for this unit.

Please note that these are proposed drafts only and cannot be duplicated without permission from Alberta Agriculture.

1. On page two of your unit, Food and Culture, the stated objective is:

"The student will become aware of a variety of foods and the part that they play in people's social and cultural lives."

Evaluate this objective on each of the criteria listed below. For each of the criteria circle the number which corresponds to your evaluation.

a) clarity

clear 5 4 3 2 1 unclear

b) related to concepts taught previously in the Nutrition at School program.

related 5 4 3 2 1 unrelated

c) tells what the student will be able to do when he/she has completed the activities in the follow-up unit

behavioral 5 4 3 2 1 non-behavioral

2. Circle the grade levels which you see the student activities in this unit as being most suitable for.

K 1 2 3 4 5 6

3. Circle the number below which corresponds to how interesting in general you think the suggested activities would be for students.

Interesting					Boring
5	4	3	2	1	

4. Circle the number below which corresponds to how much you think the materials in this unit reinforce learning of the nutrition concepts taught while your school was on the Nutrition at School program.

Reinforce learning of nutrition concepts					Don't reinforce learning of nutrition concepts
5	4	3	2	1	

5. Circle the number below corresponding to how easily you could fit the activities and objective suggested in this unit into your classroom lesson plans.

Easily integrated into classroom lessons					Difficult to integrate into classroom lessons
5	4	3	2	1	

6. What difficulties, if any, would you have fitting these objectives and activities into your classroom lesson plans? _____

7. Consider each of the following additional and/or other possible ways Alberta Agriculture might provide follow-up to the Nutrition at School program. We would like to know how more or less useful you would find these alternatives in comparison to the unit you have just reviewed.

Circle the number on the right corresponding to your answer to each of the following questions.

	MORE USEFUL			LESS USEFUL	
a) How useful would you find <u>resource lists of other visual aids</u> in comparison to the draft unit you just reviewed?	5	4	3	2	1
b) How useful would you find <u>resource lists of other teaching materials</u> in comparison to the unit you have just reviewed?	5	4	3	2	1
c) How useful would you find <u>ideas for other special projects</u> in comparison to the unit you just reviewed?	5	4	3	2	1
d) How useful would you find <u>additional classroom learning activities</u> in comparison to the unit you just reviewed?	5	4	3	2	1
e) How useful would you find <u>nutrition information for teachers</u> in comparison to the unit you just reviewed?	5	4	3	2	1
f) How useful would you find <u>mini lectures</u> in comparison to the unit you have just reviewed?	5	4	3	2	1
g) How useful would you find <u>homework exercises</u> in comparison to the unit you have just reviewed?	5	4	3	2	1

Thank you for taking the time to review this unit and answer this questionnaire.

5(1)

PART FIVE

The following nutrition education unit is a sample prepared by Alberta Agriculture for follow-up to the Nutrition at School program.

You have been randomly selected to review and provide feedback on these proposed new print materials which are now at the "draft" stage. To date four "draft" units have been prepared for the purpose of conducting further research:

Nutrition and Fitness for grades 4 - 6

Food and Culture " " 4 - 6

Farming " " K - 3

Farming " " 4 - 6

You have received one of the units to respond to. Please be candid with your comments for this unit.

Please note that these are proposed drafts only and cannot be duplicated without permission from Alberta Agriculture.

1. On page two of your unit, Farming Grades K - 3, the stated objective is:

"To provide experiences that will increase the student's information about food: where it comes from; how we get it; the different forms in which foods are available. To increase the student's acceptance of foods."

Evaluate this objective on each of the criteria listed below. For each of the criteria circle the number which corresponds to your evaluation.

a) clarity

clear 5 4 3 2 1 unclear

b) related to concepts taught previously in the Nutrition at School program.

related 5 4 3 2 1 unrelated

c) tells what the student will be able to do when he/she has completed the activities in the follow-up unit

behavioral 5 4 3 2 1 non-behavioral

2. Circle the grade levels which you see the student activities in this unit as being most suitable for.

K	1	2	3	4	5	6
---	---	---	---	---	---	---

3. Circle the number below which corresponds to how interesting in general you think the suggested activities would be for students.

Interesting				Boring	
5	4	3	2	1	

4. Circle the number below which corresponds to how much you think the materials in this unit reinforce learning of the nutrition concepts taught while your school was on the Nutrition at School program.

Reinforce learning of nutrition concepts		Don't reinforce learning of nutrition concepts
5 4 3 2 1		

5. Circle the number below corresponding to how easily you could fit the activities and objective suggested in this unit into your classroom lesson plans.

[illegible]

6. What difficulties, if any, would you have fitting these objectives and activities into your classroom lesson plans? _____

into your classroom lesson plans? _____

5(3)

7. Consider each of the following additional and/or other possible ways Alberta Agriculture might provide follow-up to the Nutrition at School program. We would like to know how more or less useful you would find these alternatives in comparison to the unit you have just reviewed.

Circle the number on the right corresponding to your answer to each of the following questions.

	MORE USEFUL			LESS USEFUL	
a) How useful would you find <u>resource lists of other visual aids</u> in comparison to the draft unit you just reviewed?	5	4	3	2	1
b) How useful would you find <u>resource lists of other teaching materials</u> in comparison to the unit you have just reviewed?	5	4	3	2	1
c) How useful would you find <u>ideas for other special projects</u> in comparison to the unit you just reviewed?	5	4	3	2	1
d) How useful would you find <u>additional classroom learning activities</u> in comparison to the unit you just reviewed?	5	4	3	2	1
e) How useful would you find <u>nutrition information for teachers</u> in comparison to the unit you just reviewed?	5	4	3	2	1
f) How useful would you find <u>mini lectures</u> in comparison to the unit you have just reviewed?	5	4	3	2	1
g) How useful would you find <u>homework exercises</u> in comparison to the unit you have just reviewed?	5	4	3	2	1

Thank you for taking the time to review this unit and answer this questionnaire.

5(1)

PART FIVE

The following nutrition education unit is a sample prepared by Alberta Agriculture for follow-up to the Nutrition at School program.

You have been randomly selected to review and provide feedback on these proposed new print materials which are now at the "draft" stage. To date four "draft" units have been prepared for the purpose of conducting further research:

Nutrition and Fitness for grades 4 - 6			
Food and Culture	"	"	4 - 6
Farming	"	"	K - 3
Farming	"	"	4 - 6

You have received one of the units to respond to. Please be candid with your comments for this unit.

Please note that these are proposed drafts only and cannot be duplicated without permission from Alberta Agriculture.

1. On page two of your unit, Nutrition and Fitness, the stated objective is:

"to have student identify that a well-balanced diet is necessary for body functions and to enable activity and that energy is expended in physical activity should be balanced with energy taken in food."

Evaluate this objective on each of the criteria listed below. For each of the criteria circle the number which corresponds to your evaluation.

- | | |
|---|-------------------------------------|
| a) clarity | clear 5 4 3 2 1 unclear |
| b) related to concepts taught previously in the Nutrition at School program. | related 5 4 3 2 1 unrelated |
| c) tells what the student will be able to do when he/she has completed the activities in the follow-up unit | behavioral 5 4 3 2 1 non-behavioral |

2. Circle the grade levels which you see the student activities in this unit as being most suitable for.

8 1 2 3 4 5 6

3. Circle the number below which corresponds to how interesting in general you think the suggested activities would be for students.

Interesting					Boring
5	4	3	2	1	

4. Circle the number below which corresponds to how much you think the materials in this unit reinforce learning of the nutrition concepts taught while your school was on the Nutrition at School program.

Reinforce learning of nutrition concepts			Don't reinforce learning of nutrition concepts		
5	4	3	2	1	
100	98	96	94	92	90
90	88	86	84	82	80
80	78	76	74	72	70
70	68	66	64	62	60
60	58	56	54	52	50
50	48	46	44	42	40
40	38	36	34	32	30
30	28	26	24	22	20
20	18	16	14	12	10
10	8	6	4	2	0
0					

5. Circle the number below corresponding to how easily you could fit the activities and objective suggested in this unit into your classroom lesson plans.

Easily integrated into classroom lessons					Difficult to integrate into classroom lessons
5	4	3	2	1	

6. What difficulties, if any, would you have fitting these objectives and activities into your classroom lesson plans? _____

7. Consider each of the following additional and/or other possible ways Alberta Agriculture might provide follow-up to the Nutrition at School program. We would like to know how more or less useful you would find these alternatives in comparison to the unit you have just reviewed.

Circle the number on the right corresponding to your answer to each of the following questions.

	MORE USEFUL					LESS USEFUL				
a) How useful would you find <u>resource lists of other visual aids</u> in comparison to the draft unit you just reviewed?	5	4	3	2	1					
b) How useful would you find <u>resource lists of other teaching materials</u> in comparison to the unit you have just reviewed?	5	4	3	2	1					
c) How useful would you find <u>ideas for other special projects</u> in comparison to the unit you just reviewed?	5	4	3	2	1					
d) How useful would you find <u>additional classroom learning activities</u> in comparison to the unit you just reviewed?	5	4	3	2	1					
e) How useful would you find <u>nutrition information for teachers</u> in comparison to the unit you just reviewed?	5	4	3	2	1					
f) How useful would you find <u>mini lectures</u> in comparison to the unit you have just reviewed?	5	4	3	2	1					
g) How useful would you find <u>homework exercises</u> in comparison to the unit you have just reviewed?	5	4	3	2	1					

Thank you for taking the time to review this unit and answer this questionnaire.

Appendix B
Sample Letters



AGRICULTURE

Planning and Research Secretariat

Agriculture Building

9718 - 107 Street

Edmonton, Alberta, Canada

TSK 2CS

Miss Josephine Blow,
Principal
Calmar School
CALMAR, Alberta

Dear Miss Blow:

Alberta Agriculture has recently commissioned the Faculty of Home Economics, University of Alberta, to conduct an evaluation of the Nutrition at School Program. The purpose is to provide input into decisions relative to:
1) Planning follow-up in schools that have previously participated in the program, and 2) Selecting and developing teacher resource materials.

Within a week to 10 days, questionnaires will be mailed to a randomly selected sample of teachers who have participated in the program during the last 4 years. In addition, another sample of teachers will be randomly selected to review and provide feedback on proposed new print materials which are now at draft stage.

As an administrator, you will have an appreciation of the value the results will have for the administration of the Nutrition at School Program. To this end, we would appreciate any support you could give to ensure the completion of the questionnaire by your teachers, should they be selected in the random sampling. We realize that in the month of June, teachers are often busy with year-end activities and therefore, we have designed the questionnaire to elicit feedback on only the most essential facets of the program. With this approach, we hope teachers will find it possible to respond quickly and with sufficient detail to guide our decisions.

We felt you would appreciate receiving this advance information about the evaluation of the Nutrition at School Program and we thank you for your cooperation in this matter. Should you wish additional information, please do not hesitate to contact me by telephone at 427-2417, or by writing to the above address.

Yours very truly,

Mona M. Cox, Member
Planning and Research Secretariat

May, 1980
MC/ga
c.c. Superintendents



403-432-3824

FACULTY OF HOME ECONOMICS

THE UNIVERSITY OF ALBERTA - EDMONTON, CANADA - T6G 2M8

June 19, 1980

TO TEACHERS SELECTED FOR THE NUTRITION AT SCHOOL EVALUATION STUDY

Dear Teacher:

A few days ago you may have received a questionnaire mailed to you from the Faculty of Home Economics at the University of Alberta. This questionnaire was designed as part of an evaluation of the Alberta Agriculture "Nutrition at School" program to solicit feedback from you about important facets of the program.

If you have completed the questionnaire and returned it to us, I wish to thank you for your prompt cooperation.

If you have not completed the questionnaire, I would appreciate it if you would find the time to complete it in the next few days and return it to us in the self-addressed, postage-paid envelope included with the questionnaire.

Your cooperation in this study will be invaluable - your input will play an important part in decisions relative to the Nutrition at School program. Your assistance is most appreciated.

If you have any questions about the questionnaire, or the study in general, please feel free to contact us by phoning 432-5770.

Barbara McEwen
Researcher

Appendix C
Additional Tables of Findings
Related to Nutrition Education Materials

Table C-1
Use of Materials From Nutrition at School Teacher Workshop by
K-3 Teachers in the Year First Involved in the Program, and in the Years Following

Years First Involved in Program and Subsequent Years	Material for K-3 Teachers									
	Big Ideas in Nutrition Education Envelope	Study Prints	Food Models	Handy Nutrition Booklet	Canada Food Guide Poster	Let's Talk About Food	Good Eats for Children	Teacher Supplement		
	No. who used	Adj. %	No. who used	Adj. %	No. who used	Adj. %	No. who used	Adj. %	No. who used	Adj. %
Teachers first involved in program in 1976/77: n=21										
*1976/77	17	81.0	13	61.9	14	66.7	11	52.4	1	4.8
1977/78	13	61.9	11	52.4	13	61.9	9	42.9	1	4.8
1978/79	12	57.1	12	57.1	13	61.9	9	42.9	2	9.5
1979/80	12	57.1	12	57.1	12	57.1	8	38.1		
Teachers first involved in program in 1977/78: n=26										
*1977/78	20	76.9	17	65.4	20	76.9	11	42.3	17	65.4
1978/79	14	53.8	10	38.5	16	61.5	5	19.2	12	46.2
1979/80	12	46.2	10	38.5	14	53.8	4	15.4	10	38.5
Teachers first involved in program in 1978/79: n=49										
*1978/79	46	93.9	40	81.6	44	89.8	27	55.1	38	77.6
1979/80	27	55.1	26	53.1	25	51.0	9	18.4	21	42.9
Teachers first involved in program in 1979/80: n=87										
*1979/80	80	92.0	72	82.8	74	85.1	45	51.7	68	78.2
									49	56.3
									51	57.3

* denotes year when teachers were first involved in the Nutrition at School Program. The years below are the years subsequent to the year of first involvement in the program.

Table C-3

Effectiveness of Materials Received at the
Nutrition at School Teacher Workshop in Teaching
Nutrition Education for all Teachers of Grades K to 3 and 4 to 6
(Adjusted percentages appear in parentheses below frequency
of teachers in each category)

Materials for Teachers of Grades K-3	Not effective		3	4	Effective 5
	1	2			
<u>Big Ideas Envelope</u>	1 (1)	5 (3)	23 (14.3)	61 (37.9)	71 (44.1)
Study Prints	3 (2.0)	2 (1.4)	11 (6.8)	50 (31.1)	82 (50.9)
Food Models	1 (1)	1 (1)	14 (9.3)	35 (23.2)	100 (66.2)
<u>Handy Nutrition</u>	8 (7.3)	10 (9.1)	41 (37.3)	36 (32.7)	15 (13.6)
Canada Food Guide Poster	2 (1.4)	4 (2.8)	41 (29.1)	49 (34.8)	45 (31.9)
<u>Good Eats For Children</u>	3 (2.9)	10 (9.5)	37 (35.2)	27 (25.7)	28 (26.7)
Teacher Supplement	5 (4.4)	3 (2.6)	20 (17.5)	47 (41.2)	39 (34.2)

Materials for Teachers of Grades 4-6	Not effective		3	4	Effective 5
	1	2			
<u>Big Ideas Package</u>	0	2 (2.1)	22 (23.4)	32 (34.0)	38 (40.4)
Bar Graphs	1 (1.1)	10 (11.5)	12 (13.8)	30 (34.5)	34 (39.1)
Food Models	1 (1.1)	5 (5.7)	18 (20.4)	33 (37.5)	31 (35.2)
<u>Handy Nutrition</u>	1 (1.4)	5 (7.1)	23 (32.9)	27 (38.6)	14 (20)
<u>How Your Body Uses Food</u>	0	4 (6.7)	21 (35)	26 (43.3)	9 (15)
Food Trek Poster	1 (2.3)	0	21 (48.8)	15 (34.9)	6 (14.0)
Canada Food Guide Poster	0	2 (2.3)	24 (27.6)	29 (33.3)	32 (36.8)
Teacher Supplement	0	2 (2.7)	21 (28.4)	31 (41.9)	21 (28.4)

TABLE C-4

Teachers' Suggestions for
Follow-up Materials

Teachers' Suggestions for Follow-up	Frequency	Adj.%
- anything to act as a reminder to motivate follow-up	4	24.3
- materials to allow students to experiment with, observe, and test	4	12.2
- new posters	3	9.1
- separate student activities for each grade level	3	9.1
- more of same types of materials as provided at teacher workshop	2	6.2
- calorie charts	1	3.1
- new worksheets	1	3.0
- puzzles and quizzes to gauge information retention	1	3.0
- teacher supplements	1	3.0
- pictures of well-balanced meals and lunches	1	3.0
- filmstrips	1	3.0
- workshops halfway through program to answer teachers' questions	1	3.0
- pamphlets on nutrition for students to keep	1	3.0
- supply mimeographed material on regular basis	1	3.0
- simple children's menus in metric	1	3.0
- divide material provided at teacher workshop into two parts, use part in follow-up session	1	3.0
- evaluation materials	1	3.0
- filmstrips and videotapes	1	3.0

Appendix D

Tables of Findings Related to
Teachers' Evaluation of
the Nutrition at School
Follow-up Units

Table D-1

Teachers' Evaluation of Objectives
and Activities in the Unit,
Nutrition and Fitness
(Adjusted percentages in parentheses)

Clarity of Objective	Unclear			Clear	
	1	2	3	4	5
Freq.	0	1	1	7	3
Adj%		(8.3)	(8.3)	(58.3)	(25.0)
Relation of objective to previously taught concepts	Unrelated			Related	
	1	2	3	4	5
Freq.	0	1	2	3	4
%		(8.3)	(16.7)	(41.7)	(33.3)
Specificity of objective (Stated in behavioral terms)	Non-behavioral			Behavioral	
	1	2	3	4	5
Freq.	1	2	3	6	1
%	(8.3)	(16.7)	(25.0)	(50.0)	(8.3)
How interesting are activities	Boring			Interesting	
	1	2	3	4	5
Freq.	0	0	2	7	3
%			(16.7)	(58.3)	(25.0)
Do activities reinforce learning of previously taught concepts?	Don't reinforce			Reinforce	
	1	2	3	4	5
Freq.	0	1	1	8	2
%		(8.3)	(8.3)	(66.7)	(16.7)
Ease of integration of activities into class- room lesson plans	Difficult to integrate			Easily integrated	
	1	2	3	4	5
Freq.	1	1	0	9	1
%	(8.3)	(8.3)		(75.0)	(8.3)

Table D-2

Teachers' Perception of the
Suitability of the Unit,
Nutrition and Fitness
For Each Grade Level

Grade Level	Teachers Stating Unit Suitable for Grade Level	
	Freq.	Adj. %
k	0	0
1	0	0
2	0	0
3	0	0
4	5	41.7
5	9	75.0
6	8	66.7

Table D-3
 Teachers' Evaluation of Objectives
 and Activities in the Unit,
Food and Culture
 (Adjusted percentages in parentheses)

Clarity of Objective	Unclear			Clear	
	1	2	3	4	5
Freq.	0	0	2	6	2
Adj%			(20.0)	(60.0)	(20.0)
Relation of objective to previously taught concepts	Unrelated			Related	
	1	2	3	4	5
Freq.	0	3	3	3	1
%		(30.0)	(30.0)	(30.0)	(10.0)
Specificity of objective (Stated in behavioral terms)	Non-behavioral			Behavioral	
	1	2	3	4	5
Freq.	1	1	4	3	1
%	(10.0)	(10.0)	(40.0)	(30.0)	(10.0)
How interesting are activities	Boring			Interesting	
	1	2	3	4	5
Freq.	0	2	1	6	2
%		(18.2)	(9.1)	(54.5)	(18.2)
Do activities reinforce learning of previously taught concepts?	Don't reinforce			Reinforce	
	1	2	3	4	5
Freq.	0	0	4	3	4
%			(36.4)	(27.3)	(36.4)
Ease of integration of activities into class- room lesson plans	Difficult to integrate			Easily integrated	
	1	2	3	4	5
Freq.	1	1	2	4	2
%	(10.0)	(10.0)	(20.0)	(40.0)	(20.0)

Table D-4

Teachers' Perception of the
Suitability of the Unit,
Food and Culture
for Each Grade Level

Grade Level	Teachers Stating Unit Suitable for Grade Level	
	Freq.	Adj. %
k	1	9.1
1	1	9.1
2	1	9.1
3	3	27.3
4	7	63.6
5	5	45.5
6	6	54.5

Table D-5
 Teachers' Evaluation of Objectives
 and Activities in the Unit,
Farming K to 3
 (Adjusted percentages in parentheses)

Clarity of Objective	Unclear			Clear	
	1	2	3	4	5
Freq.	0	0	1	8	10
Adj%			(5.6)	(44.4)	(55.6)
Relation of objective to previously taught concepts	Unrelated			Related	
	1	2	3	4	5
Freq.	0	2	6	7	3
%		(11.1)	(33.3)	(38.9)	(16.7)
Specificity of objective (Stated in behavioral terms)	Non-behavioral			Behavioral	
	1	2	3	4	5
Freq.	1	2	5	5	5
%	(5.6)	(11.1)	(27.8)	(27.8)	(27.8)
How interesting are activities	Boring			Interesting	
	1	2	3	4	5
Freq.	0	0	2	13	3
%			(11.1)	(72.2)	(16.7)
Do activities reinforce learning of previously taught concepts?	Don't reinforce			Reinforce	
	1	2	3	4	5
Freq.	0	1	5	8	4
%		(11.1)	(27.8)	(44.4)	(22.2)
Ease of integration of activities into class- room lesson plans	Difficult to integrate			Easily integrated	
	1	2	3	4	5
Freq.	0	2	1	9	6
%		(11.1)	(5.6)	(50.0)	(33.3)

Table D-6

Teachers' Perception of the
Suitability of the Unit,
Farming K to 3
for Each Grade Level

Grade Level	Teachers Stating Unit Suitable for Grade Level	
	Freq.	Adj. %
k	4	22.2
1	11	61.1
2	17	94.4
3	11	61.1
4	3	16.7
5	2	11.1
6	2	11.1

Table D-7

Teachers' Evaluation of Objectives
and Activities in the Unit,
Farming 4 to 6
(Adjusted percentages in parentheses)

Clarity of Objective	Unclear			Clear	
	1	2	3	4	5
Freq.	1	0	2	6	7
Adj%	(6.3)		(12.6)	(37.5)	(43.8)
Relation of objective to previously taught concepts	Unrelated			Related	
	1	2	3	4	5
Freq.	0	1	3	6	6
%		(6.3)	(18.8)	(37.5)	(37.5)
Specificity of objective (Stated in behavioral terms)	Non-behavioral			Behavioral	
	1	2	3	4	5
Freq.	1	1	5	4	5
%	(6.3)	(6.3)	(31.3)	(25.0)	(31.3)
How interesting are activities	Boring			Interesting	
	1	2	3	4	5
Freq.	0	1	3	9	7
%		(5.0)	(15.0)	(45.0)	(35.0)
Do activities reinforce learning of previously taught concepts?	Don't reinforce			Reinforce	
	1	2	3	4	5
Freq.	0	1	2	11	4
%		(5.6)	(11.1)	(61.1)	(22.2)
Ease of integration of activities into class- room lesson plans	Difficult to integrate			Easily integrated	
	1	2	3	4	5
Freq.	0	3	4	8	4
%		(15.8)	(21.1)	(42.1)	(21.1)

Table D-8
 Teachers' Perception of the
 Suitability of the Unit,
Farming 4 to 6
 for Each Grade Level

Grade Level	Teachers Stating Unit Suitable for Grade Level	
	Freq.	Adj. %
k	0	0
1	1	5.6
2	1	5.6
3	1	5.6
4	11	61.1
5	15	83.3
6	9	50.0

Table D-9

Teachers' Attitudes to Other Types of Follow-up
Materials in Terms of Their Usefulness Compared to the Unit,
Nutrition and Fitness
(Adjusted percentages in parentheses)

	Usefulness of Material				
	Less Useful		More Useful		
	1	2	3	4	5
How useful would you find resource lists of other visual aids in comparison to the draft unit you just reviewed?	0	5 (41.7)	2 (16.7)	5 (41.7)	0
How useful would you find resource lists of other teaching materials in comparison to the unit you have just reviewed?	0	7 (58.3)	2 (16.7)	3 (25.0)	0
How useful would you find ideas for other special projects in comparison to the unit you just reviewed?	0	4 (33.3)	5 (41.7)	2 (16.7)	1 (8.3)
How useful would you find additional classroom learning activities in comparison to the unit you just reviewed?	1 (8.3)	0	6 (50.0)	3 (25.0)	1 (8.3)
How useful would you find nutrition information for teachers in comparison to the unit you just reviewed?	1 (8.3)	2 (16.7)	3 (25.0)	2 (16.7)	2 (16.7)
How useful would you find mini lectures in comparison to the unit you just reviewed.	2 (16.7)	5 (41.7)	3 (25.0)	1 (8.3)	0
How useful would you find homework exercises in comparison to the unit you just reviewed?	4 (33.3)	3 (25.0)	2 (16.7)	2 (16.7)	0

Table D-10

Teachers' Attitudes to Other Types of Follow-up
Materials in Terms of Their Usefulness Compared to the Unit,
Food and Culture
(Adjusted percentages in parentheses)

	Usefulness of Material				
	Less Useful		More Useful		
	1	2	3	4	5
How useful would you find resource lists of other visual aids in comparison to the draft unit you just reviewed?	1 (9.1)	3 (27.3)	2 (18.2)	5 (45.5)	0
How useful would you find resource lists of other teaching materials in com- parison to the unit you have just reviewed?	1 (9.1)	4 (36.4)	3 (27.3)	3 (27.3)	0
How useful would you find ideas for other special projects in comparison to the unit you just reviewed?	0	3 (27.3)	4 (36.4)	1 (9.1)	3 (27.3)
How useful would you find additional classroom learn- ing activities in comparison to the unit you just reviewed?	1 (9.1)	1 (9.1)	5 (45.5)	2 (18.2)	2 (18.2)
How useful would you find nutrition information for teachers in comparison to the unit you just reviewed?	1 (10.0)	1 (10.0)	3 (30.0)	4 (40.0)	1 (10.0)
How useful would you find mini lectures in comparison to the unit you just reviewed.	3 (27.3)	2 (18.2)	3 (27.3)	1 (9.1)	2 (18.2)
How useful would you find homework exercises in comparison to the unit you just reviewed?	4 (36.4)	2 (18.2)	3 (27.3)	2 (18.2)	0

Table D-11

Teachers' Attitudes to Other Types of Follow-up
Materials in Terms of Their Usefulness Compared to the Unit,
Farming K-3
(Adjusted percentages in parentheses)

	Usefulness of Material				
	Less Useful		More Useful		
	1	2	3	4	5
How useful would you find resource lists of other visual aids in comparison to the draft unit you just reviewed?	1 (5.6)	5 (27.8)	4 (22.2)	6 (33.3)	2 (11.1)
How useful would you find resource lists of other teaching materials in com- parison to the unit you have just reviewed?	0	4 (25.0)	5 (31.3)	6 (37.5)	1 (6.3)
How useful would you find ideas for other special projects in comparison to the unit you just reviewed?	0	1 (6.3)	8 (50.0)	5 (31.3)	2 (12.6)
How useful would you find additional classroom learn- ing activities in comparison to the unit you just reviewed?	0	2 (12.6)	5 (31.3)	7 (43.8)	2 (12.6)
How useful would you find nutrition information for teachers in comparison to the unit you just reviewed?	1 (5.6)	4 (22.2)	3 (16.7)	7 (38.9)	3 (16.7)
How useful would you find mini lectures in comparison to the unit you just reviewed.	3 (17.6)	4 (23.5)	5 (29.4)	5 (29.4)	0
How useful would you find homework exercises in comparison to the unit you just reviewed?	6 (37.5)	6 (37.5)	1 (6.3)	3 (18.8)	0

Table D-12

Teachers' Attitudes to Other Types of Follow-up
Materials in Terms of Their Usefulness Compared to the Unit,
Farming 4 to 6
(Adjusted percentages in parentheses)

	Usefulness of Material				
	Less Useful			More Useful	
	1	2	3	4	5
How useful would you find <u>resource lists of other</u> <u>visual aids in comparison</u> to the draft unit you just reviewed?	1 (5.6)	3 (16.7)	6 (33.3)	6 (33.3)	2 (11.1)
How useful would you find <u>resource lists of other</u> <u>teaching materials in com-</u> <u>parison to the unit you</u> have just reviewed?	0	4 (21.1)	8 (42.1)	6 (31.6)	1 (5.3)
How useful would you find <u>ideas for other special</u> <u>projects in comparison to</u> the unit you just reviewed?	0	0	10 (50.0)	8 (40.0)	2 (10.0)
How useful would you find <u>additional classroom learn-</u> <u>ing activities in comparison</u> to the unit you just reviewed?	0	1 (5.0)	12 (60.0)	6 (30.0)	1 (5.0)
How useful would you find <u>nutrition information for</u> <u>teachers in comparison to</u> the unit you just reviewed?	0	4 (21.1)	7 (36.8)	5 (26.3)	3 (15.8)
How useful would you find <u>mini lectures in comparison</u> to the unit you just reviewed.	2 (10.0)	9 (45.0)	3 (15.0)	5 (25.0)	1 (5.0)
How useful would you find <u>homework exercises in</u> <u>comparison to the unit you</u> just reviewed?	5 (25.0)	9 (45.0)	5 (25.0)	1 (5.0)	0